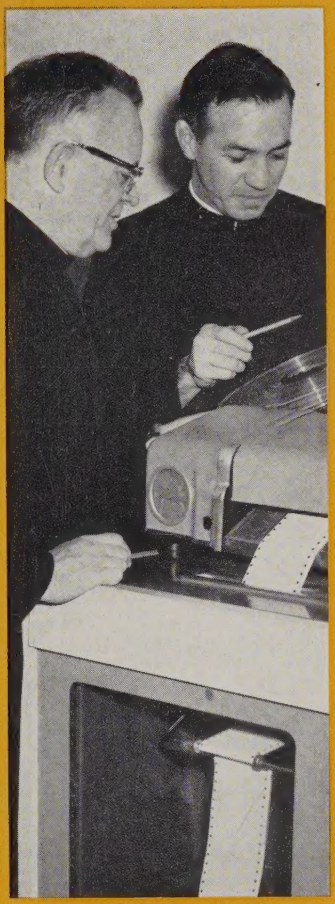
December 1961

BUSINESS AUTOMATION

Punched Card System Control

page 14



Faith, Hope and Computer

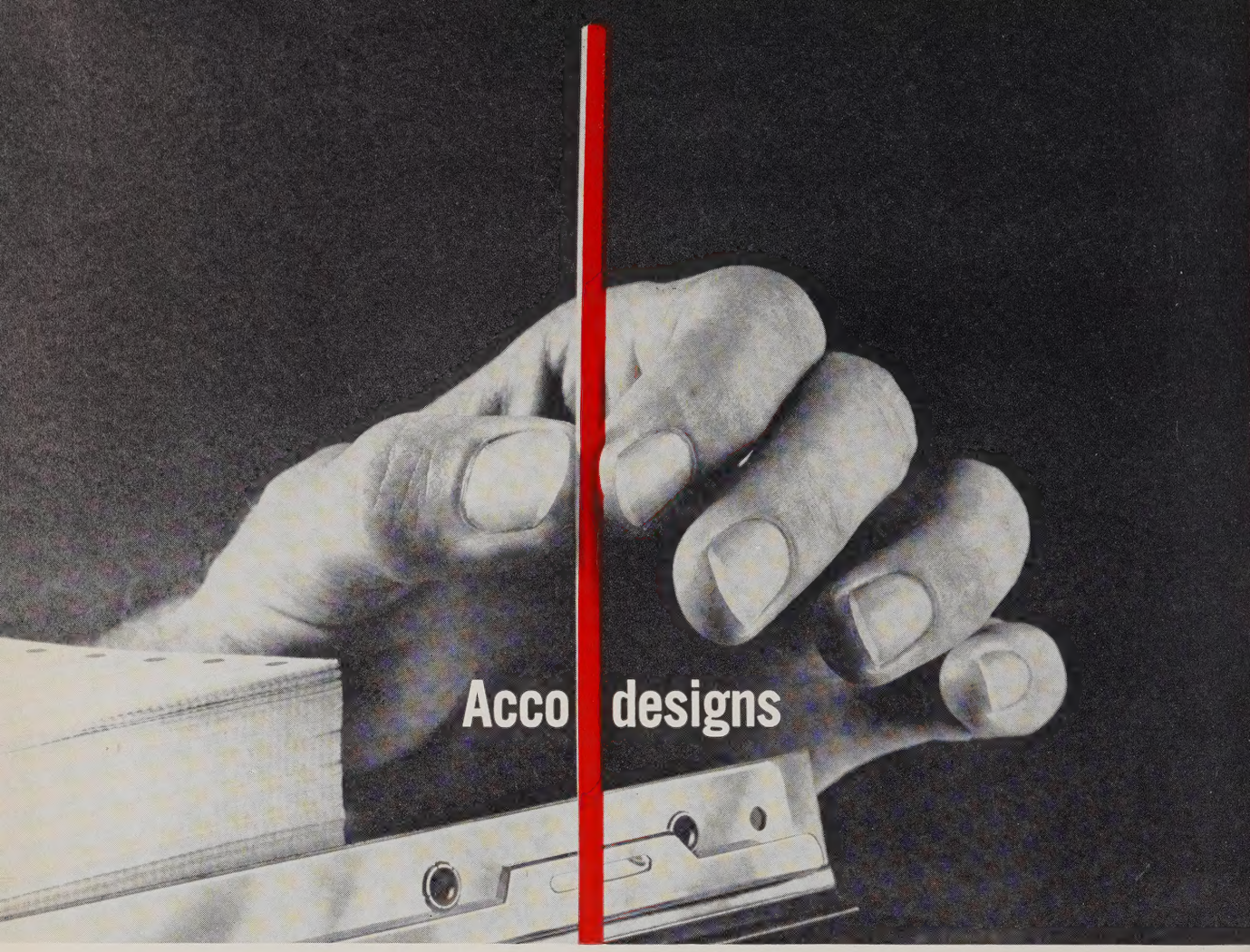
page 20

Eight Hands For the Typist

page 38

Programing for Cosmetics

page 30



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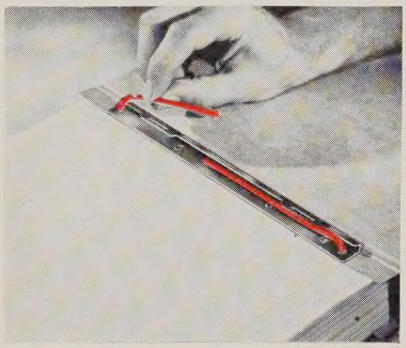

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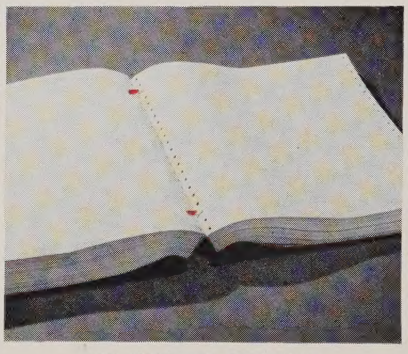

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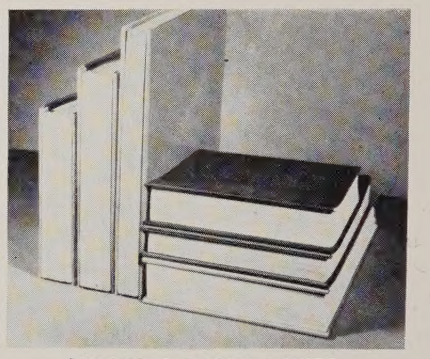

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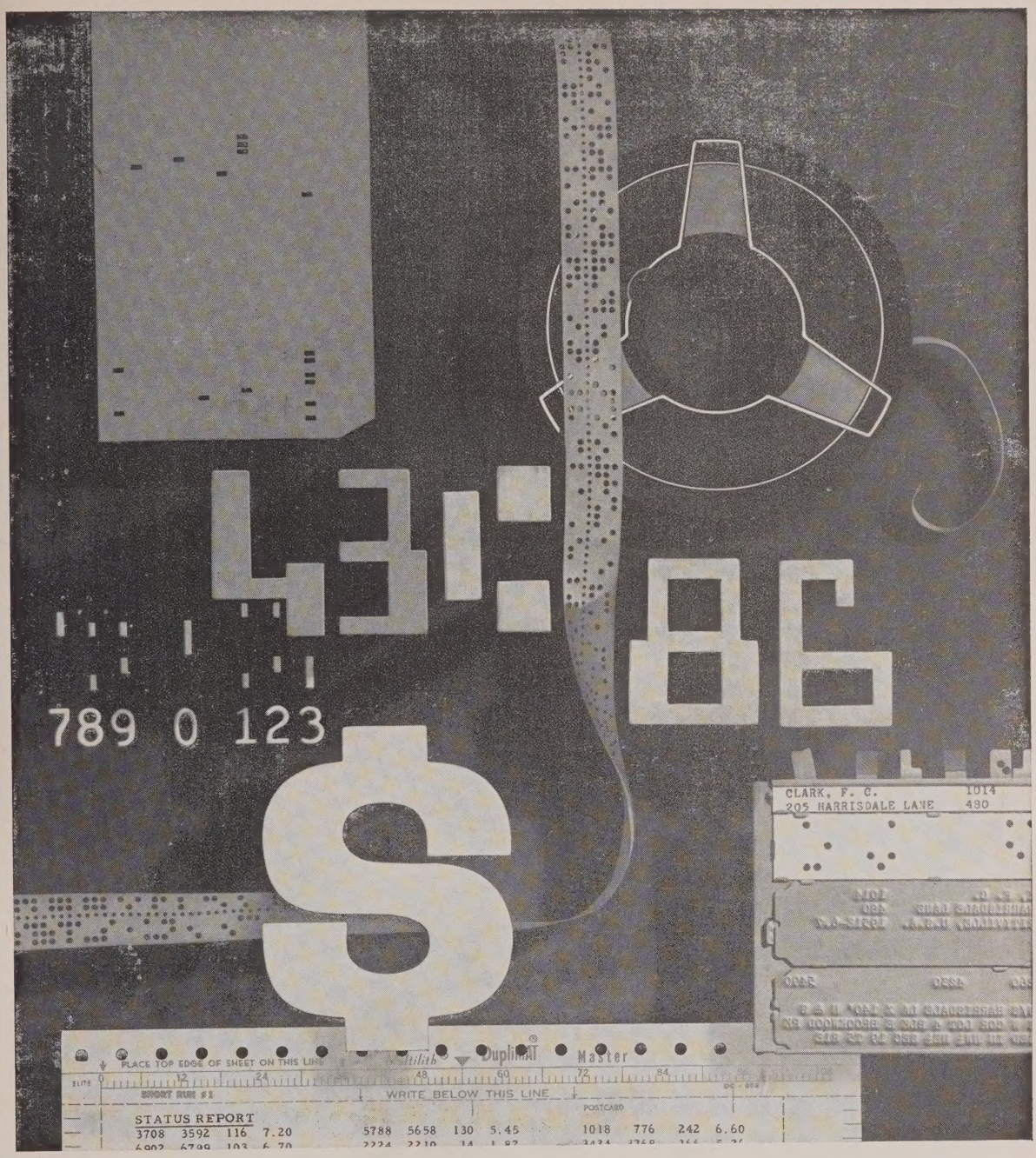

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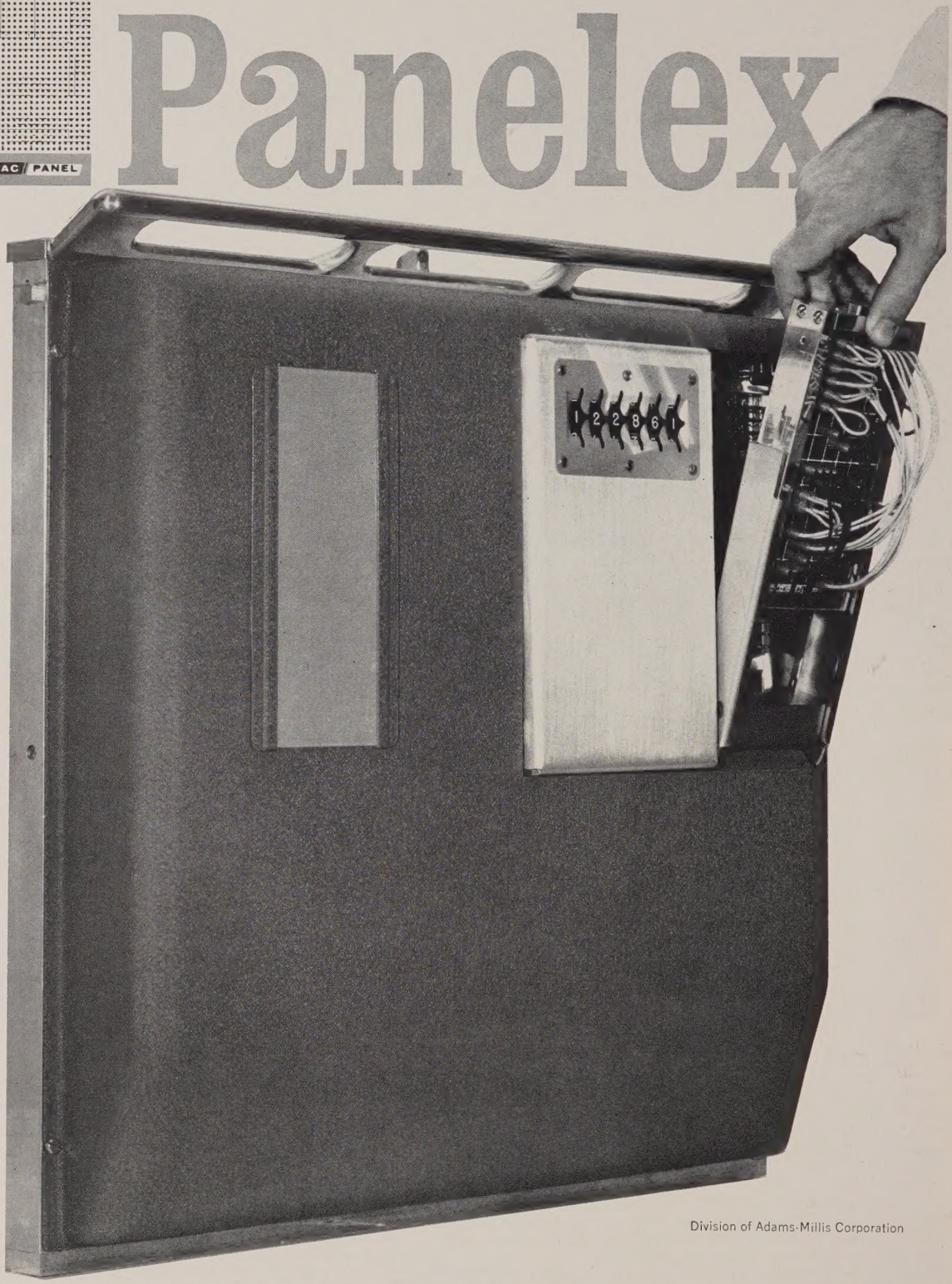

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BUSINESS AUTOMATION

Reporting and interpreting for management on ideas, developments, applications, results and impact of business automation in commerce, industry and government.

Dec., 1961
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14 Punched Card System Control
By Albert Kushner and Dallas H. Dobelbower
Planning for efficient control of punched card departments.

20 Faith, Hope and Computer
By Donald Young
Religious order conducts a mail campaign with 85 percent response.

26 EDP's Working On the Railroad
Training is the role of Canadian National's revamped railroad car.

30 Programing for Cosmetics
Codematic is a unique IBM 650 program devised at Helene Curtis.

38 Eight Hands For The Typist
Automatic typewriters increase policy-writing operations 400 percent.

42 Cartridge Tape System Is Fast, Compact
Product Preview

44 Computer Now Has "Answering Voice"
Product Preview

6 Quotes
8 Letters
9 Random Access
12 Publisher's Desk
46 Showcase
56 On Request
57 News
61 Business Calendar

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Recall

Selections of current comment

"Today, the demand for skilled and unskilled office personnel continues to outpace the development of time- and labor-saving office machines. There is a shortage of qualified personnel such as secretaries, stenographers, typists, office machine operators and clerical workers in general. This shortage continues despite a steady increase in the total number of office workers. The Department of Labor reports the white collar force grew from 24 million in 1955 to 28 million in 1960, and predicts it will increase further to 37 million by 1970.

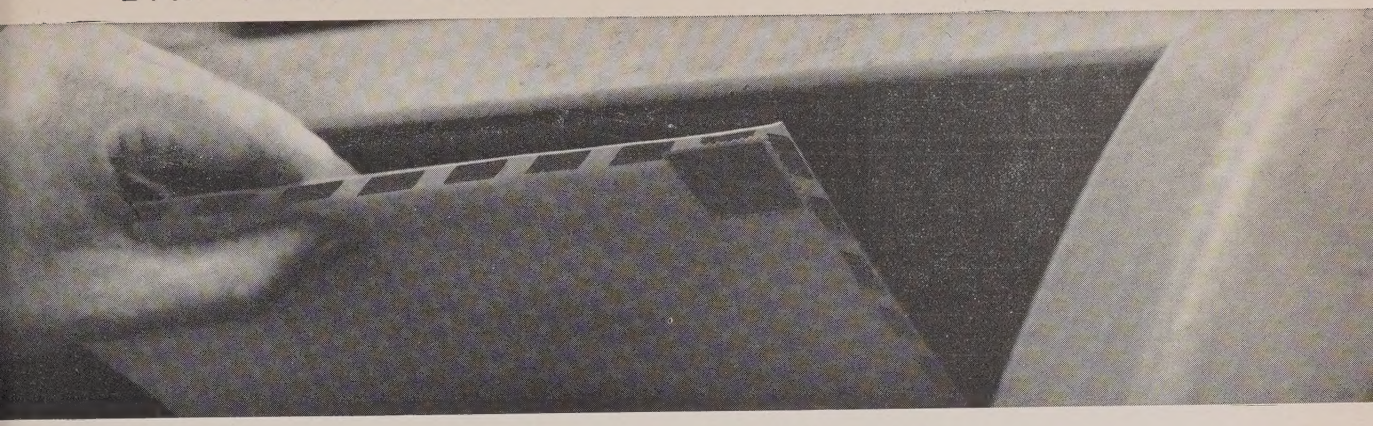
"One reason for the continued demand for personnel and machines is that many new office products supplement, but do not replace, conventional equipment. For example, photo-copy machines are used to copy material which is usually prepared on the typewriter. Stencils for duplicating machines and the transcribing of material from dictating machines obviously require a typewriter and a typist for their preparation. The human element continues to be an essential ingredient at some stage of even the most advanced system." *—Emerson E. Mead, president, Smith-Corona Merchant, Inc.*

"For improved advertising approaches, it is necessary not to ignore the complexity of our markets (as motivation research does), but to take the complex data that market research provides and carry out the kind of integration or synthesis that businessmen of an earlier time could themselves do as they put together all that they heard from customers.

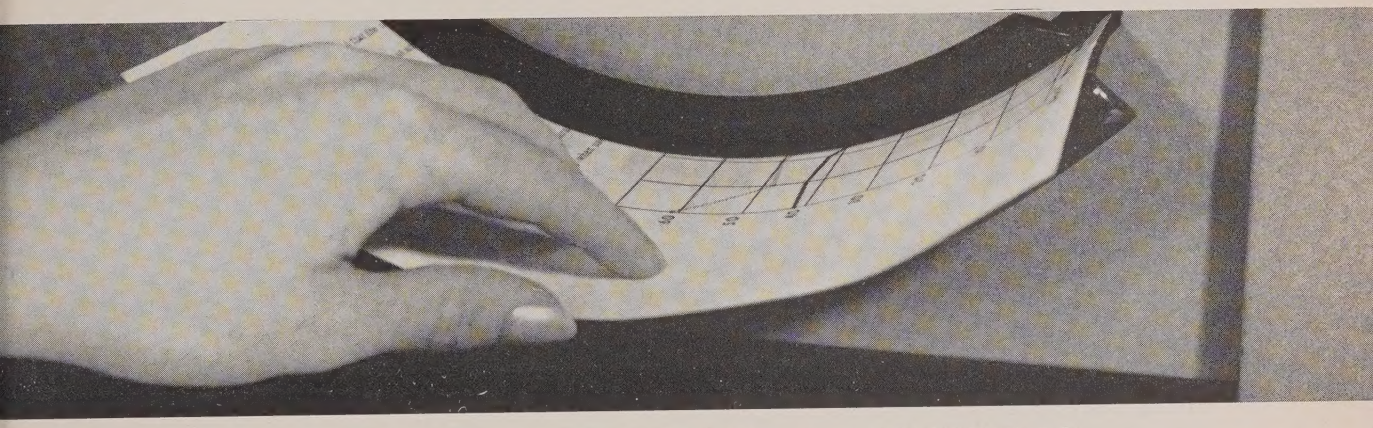
"Electronic computers can help make this possible with simulation because they can for the first time incorporate real life processes into statistical analyses. Thus, we are enabled to look at public opinion not as something static, but as a flow."*—Dr. James S. Coleman, chairman, Department of Social Relations, Johns Hopkins University, in a speech before the American Assn. of Advertising Agencies.*

"There is considerable controversy in the industry on whether machines really can 'think,' but the stage of 'intelligent behavior' similar to the thinking process of the human brain is being approached. It is a pretty far cry, however, to say that a machine will ultimately function as well as the human mind in decision-making. One can only observe that the machine will perhaps be more tireless."*—Dr. Edward Feigenbaum, University of California.*

From Seattle to Miami



To Air-Mail this report: 40 HOURS



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WHAT SCAN-A-FAX CAN DO FOR YOUR COMPANY: If your company needs to get errorless facts quickly from one place to another, Scan-A-Fax should be ideal for you. With this system, you can get memos, charts, schedules, blueprints, drawings, and photos in minutes instead of days. For example you can transmit as many as twenty 8½″ x 11″ documents in an hour over long-distance telephone lines or by microwave.

A major airline tested Scan-A-Fax to transmit freight manifests, dispatch records and air freight bills 24 hours a day between Idlewild, LaGuardia and Newark Airports. Results were excellent. So excellent, in fact, that the airline ordered a system.

WHAT ARE THE FEATURES OF SCAN-A-FAX? This is the first completely transistorized facsimile system, which means you can operate it 24 hours a day, day-in and day-out. Flat-bed feed lets you transmit any copy up to 8½ inches wide, in almost unlimited lengths. "Rapid Index" lets you skip unnecessary data, a big savings in transmission time.

WHAT TO DO FOR MORE INFORMATION: The value of Scan-A-Fax will vary with the specifics of each application. Write to have one of our facsimile analysts survey your company's needs. Or write for our booklet: "To Deliver the Facts...Fast."

TRANSMITTER-SCANNER is easy to operate: just insert the copy and press the transmit button. Copy runs through the machine at 1.8 inches per minute.

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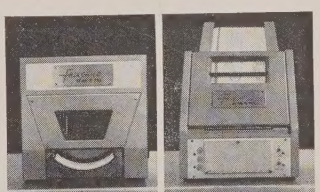

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For More Information Circle Reader Service Card No. 156

Letters

Dear Sir:

This office requests that you grant us written permission to reproduce (from the June 1961 issue of BUSINESS AUTOMATION) the article "Crisis in Machine Accounting" for educational use within the Government.

W. Howard Gammon
Data Systems Review Div.
Office of the Assistant Secretary of Defense
Washington, D. C.

Ed. Note: Permission Granted

Dear Sir:

I seldom write letters of appreciation unless I truly believe someone or something is really deserving of such a letter.

Therefore, I would like to take this opportunity to inform you that your publication, BUSINESS AUTOMATION, is an outstanding magazine for anyone involved in systems and procedures work. The articles on business applications are very well written and the information I derive from them is very helpful to me for present and future applications. Also, the product review keeps me well informed about the latest equipment available and I receive many of my ideas for management through their applications by other companies.

O. A. Spitzer
Secretary, Chicago Chapter
Systems and Procedures Assn.

Dear Sir:

It would appear Mr. Christian's article, "Don't Bet on Business Games," which concludes that "games are a poor bet . . . for more than computer indoctrination on the most elementary level," ignores the evidence in the article and the bulk of evidence in the references quoted. Games are not designed or played to give a complete business experience. However, they can give certain dynamic aspects to business training not available in other pedagogic devices. For example, in teaching production planning, the dimension of time can be added to a classroom experience by use of a game in that the students have to live with past decisions.

Perhaps the author might have given other quotes from the Cohen article, which strongly supports the use of games in business administration education. In my own experience, I find that most students forget the computer and concentrate of their competition. This affords them a capsule version of the personnel, psychological and sociological problems of business situations.

Games are like all teaching devices in that they must have goals and be integrated in a curriculum. When properly used, they add a dynamic dimension to a learning situation which is quite valuable in business education. I do not feel Mr. Christian has presented an unbiased, reasoned discussion.

James L. McKenney
Assistant Professor
Business Administration
Harvard University
Graduate School

Dear Sir:

Your editorial "Crisis in the Machine Room" appearing in the June 1961 issue is potentially more helpful to those of us with operational responsibilities than anything I have ever seen in print.

Not many managers could deny more than a part of this article being true in their operations.

Considering the number of installations with a degree of their production headed for our "biggest waste baskets," you have painted a picture of a multi-million dollar problem—every month!

If a sizeable portion of this waste of manpower, materials and machine time can be diverted to usable output, it would create quite a bonus for the businesses using our services.

More capacity with no more cost —this could be a happy puzzle for top management.

Gerald W. Hale
Data Processing Manager
Iowa Farm Bureau Federation
Des Moines, Ia.

Random Access

Information bits from the editors' memory files

Name-Calling Computer

What does a corporation do when it wants a new name? Why, ask a computer, of course!

This is just what American Steel Foundries Corp. did when it decided it had grown too big for its breeches—and its old name. The computer gave them one, too—Amsted—but not until it had digested thousands of bits of information and suggested some 7,000 other names.

Initials and family names were dismissed by the corporation. Finally, it was decided that the new name should have the following qualifications: (1) be legally available; (2) bear some relationship to the divisions of the company in and out of the United States; (3) have an aggressive sound; (4) be unique; (5) lend itself well to visual and audio presentation; and (6) be related in part to the old American Steel Foundries title. To do this, a computer was called upon.

"Amstef" came close, but "Amsted" won out due to its decisive sound. The selection of the name by computer came first; the explanation came next: "Ams" for American Steel and "ted" for transportation equipment division—the company's biggest area of operation.

Amsted Industries, Inc., proudly bears its spanking new computer-given title . . . pending human approval at the corporation's next stockholder's meeting on January 23.

Old Theorem Speeds Computers

Arithmetic taken from a 2,000-year-old Chinese Theorem may be able to increase computer speeds up to 20 times. With the current arithmetic used in computers, there is a "wait" while figures are "carried" before the machine can catch up with the main calculation. With the Chinese "remainder theorem," a modern approach is used, making the remainder a part of the calculation and thereby reducing computing time.

Rediscovery of the theorem is credited to a Czech scientist and was brought to the attention of Howard Aiken, head of the Harvard Computation Laboratory and a consultant to Lookheed Missiles and Space Co., who is investigating practical use of the theory.

Homeric Computer

Electronic computers have now begun to solve literary mysteries. The first outstanding example is proving that Homer wrote the Iliad. There was some controversy among literary critics that the Iliad actually was a cycle of songs which were put together 500 years after Homer's death.

This problem seems to have been solved to the satisfaction of most of the literati since a computer analyzed the 15,639 lines of the epic and determined that the meter and stylistic mannerisms of the Iliad fall into one consistent pattern.

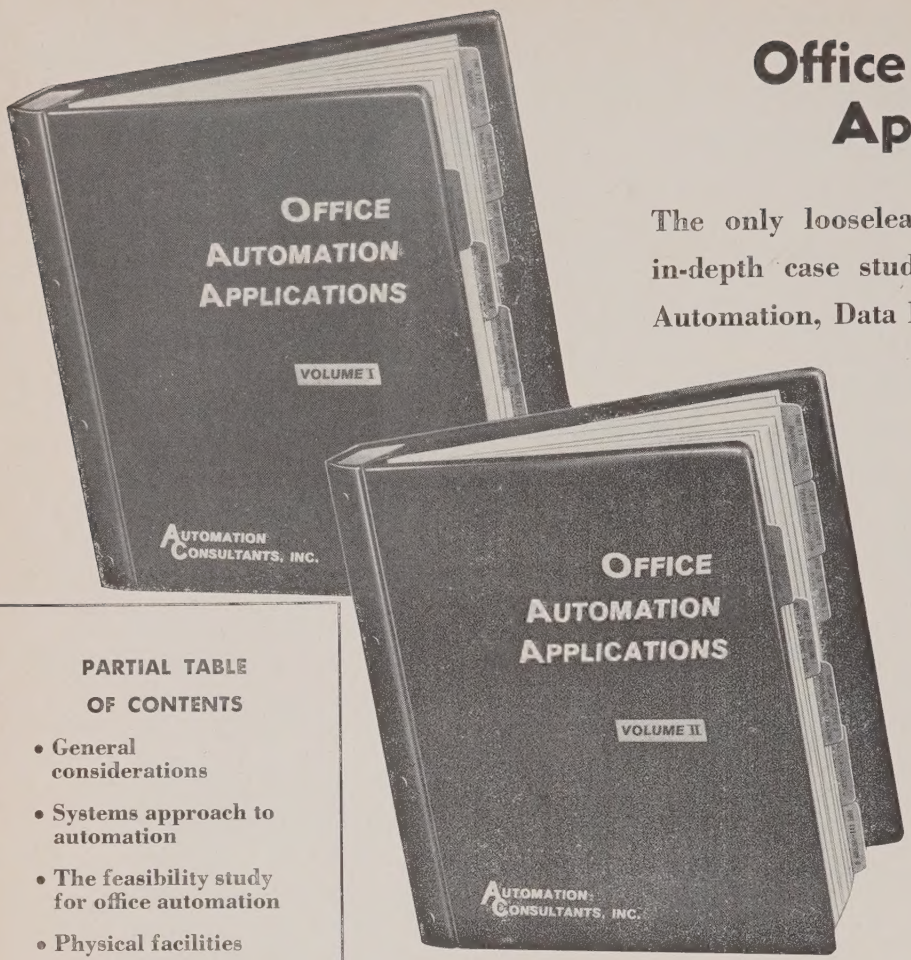
Now, what about Shakespeare?

Got the Message

A silent paging system used by the Oldsmobile Division of General Motors tells plant supervisors when they have a call by gently tickling them. The supervisor then phones the operator and picks up his message.

Made by the AC Spark Plug Division of GM, the VibaCall is worn on the belt. Oldsmobile uses 52 of the units, plus two encoder (calling) stations and 32,000 ft. of antenna to cover a four million-square foot area.

Office Automation Applications



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- General considerations
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- The feasibility study for office automation
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- Selecting, training and organizing computer personnel
- Programming the data processing system
- Principles of operations research
- Role of the consultant in EDP

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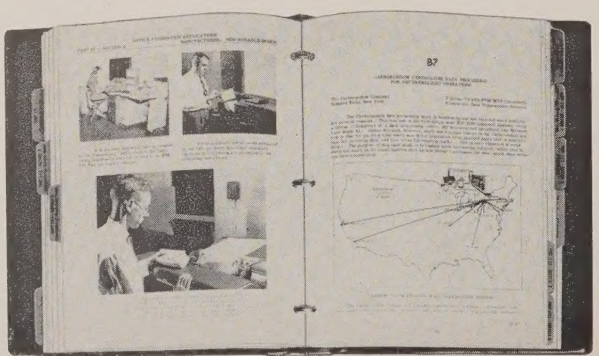

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- Order Entry
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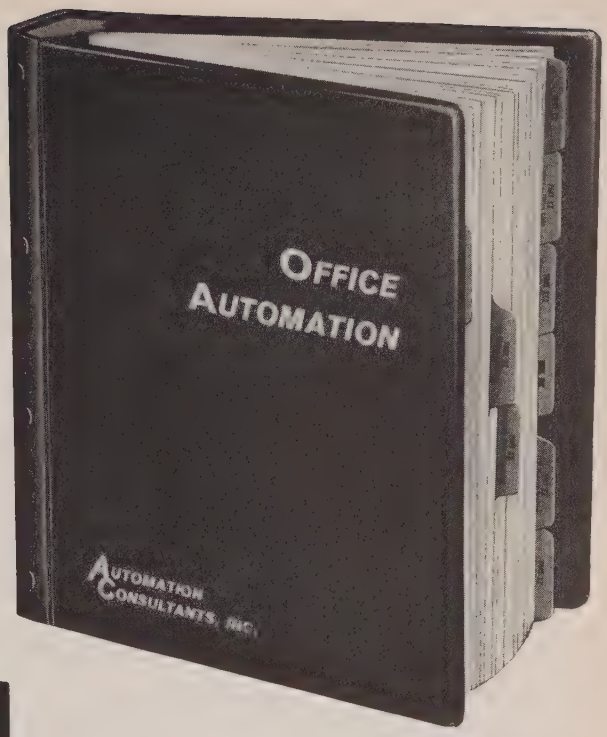

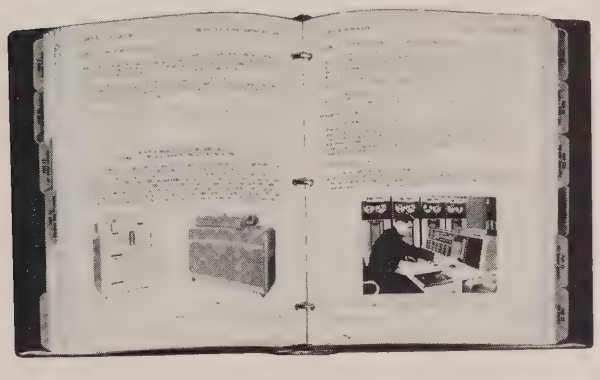

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OFFICE AUTOMATION contains chapters on:

- **Punched card accounting systems**
- **Electronic computers**
- **Medium and small scale computers**
- **Electrical communications and how they assist office automation**
- **Descriptions of native and common language machines**
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- **EDP printers for computer output-descriptions, illustrations and comparative chart**

Other chapter headings

- **How Is a Computer Programmed?**
- **What Computers Can and Cannot Do**
- **Points To Be Carefully Watched When Acquiring a Computer**
- **Should Electronic Equipment Be Purchased Or Leased?**
- **Helpful Reading Material On Electronics Conferences, Exhibits, Seminars, Schools and Films of Interest**

For More Information Circle Reader Service Card No. 160

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AUTOMATION CONSULTANTS, INC.

An Invitation to Participate In

BUSINESS AUTOMATION'S

Second National

Salary Survey, Computer Department Positions

January, 1962

Recognized by the industry as the only complete survey of computer department personnel positions and salaries, the second nationwide study will be conducted, in January, 1962 by the Research Bureau of BUSINESS AUTOMATION magazine under the direction of Philip H. Weber & Assoc., Inc., noted employe compensation specialists. If you wish your company to be statistically represented and to receive a special report of this useful survey, fill in the coupon below. You will receive a simple to fill out survey questionnaire along with a list of standardized position descriptions. The information which you return remains confidential.

BUSINESS AUTOMATION
288 Park Avenue West, Elmhurst, Illinois

We will be glad to participate in the Second National Salary Survey of Computer Department Positions, January, 1962

Please send survey material to:

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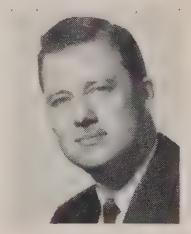

VIRTUALLY ALL OF OUR editorial material is authored by one or more of our own staff editors. Occasionally a feature article is submitted by an outside authority worth sharing with BUSINESS AUTOMATION readers.

Such an article appears as our lead feature this month. The authors are Albert Kushner and Dallas H. Dobelbower, who are associated with the management consulting firm of Cresap, McCormick and Paget. Mr. Kushner specializes in data processing and Mr. Dobelbower is mainly concerned with overall systems operations. Both are well qualified to write on how to efficiently manage a tab room installation.

Illustrative of the many diverse applications in the world of business automation is the feature report on the Society of the Divine Savior. Using some of the latest direct mail processing equipment, this Catholic order has streamlined its fund-raising operations to the point where it can serve as a model of efficiency to many organizations in business for profit.

A unique method of providing on-the-job ADP training facilities has been developed by Canadian National Railways. It is featured on page 26. Although most firms don't have their own railroad cars, there is a lesson to be learned here by any business with numerous branch operations.

Arnold Keller reports on a new programing aid called "Codematic" on page 30. With more attention being directed to automation software these days, this presentation has special significance.

This issue completes our third year of regular monthly publication. We are grateful for the reader interest and loyalty that has been developed during this time. The future promises a continually expanding editorial service . . . designed to the demands of the fast-paced field of business automation.

Charles W. Gilbert

BUSINESS AUTOMATION

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Planning and scheduling is the subject of first of three articles dealing with efficient control of punched card systems.

Punched Card System Control

By Albert Kushner and Dallas H. Dobelbower

BEHIND practically every receipt and disbursement of funds in many industries today lie important management policies and decisions based upon special periodic reports produced by punched cards. If the information on punched cards is wrong or ill-chosen, or if the reports are late or cost too much to prepare, the business will suffer.

A minimal practical punched card system can cost as much as $25,000 a year to operate. Not uncommon are $100,000 systems. A few run to several millions. If the system is properly used, these costs may be small in relation to the benefits gained. In a poorly run installation, as much as a third or a half of this expenditure can be wasted.

More and more business managers are questioning the effectiveness of their machine accounting installations. Some are sure that they're not getting what they are paying for. Others—and these are by far the majority—just don't know.

Many people engaged in machine accounting feel that if they approach the mythical range of 80 to 85 percent utilization, their system is automatically a success; but trying to find out whether their installation actually falls within this range and the true significance of the utilization figure represents, for most investigators, a virtually unsolvable problem.

The need for controlling punched card production springs not only from its cost and its importance to the operation of the business, but from its very complexity. An understanding of this complex control problem, as presented by an average-to-large punched card installation, can best be gained by comparing it to the industrial control problem that is presented by products made up of many parts and sub-assemblies. These must be brought together in the proper quantity, quality, time and place (Exhibit 1 develops the parallel in detail).

This parallel also points to the one direct approach to the improvement of machine accounting effectiveness—through the use of a control system such as might be applied to any production process, one which specifies performance criteria, measures actual performance against these criteria and explains reasons for variances.

Basically, such a system of production control is made up of procedures for planning, performing and reporting. Planning involves routing and scheduling considerations. Routing specifies the ideal sequence of operations for a given job—from

About the Authors

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Mr. Dobelbower is a senior associate of CMP and has engaged in consulting assignments covering various areas of office organization and management. Before CMP he was a consultant on the management advisory services staff of a leading accounting firm; a research associate for the Life Office Management Assn. and author of several of its publications; a planning assistant for the Mutual Life Ins. Co. of New York; and a statistical officer in the U. S. Air Force. He holds a M.B.A. in management from New York Univ., Graduate School of Business Administration a B.B.A. in Marketing from Rutgers Univ., and a B. A. in economics from Dartmouth College.

Exhibit 1

Characteristics of Processing Requiring Control

General	Related To Punched Card Accounting
1. Many parts in the product.	1. Multiple lots of punched cards are required in the production of many transaction documents and most management reports.
2. Several operations on each part.	2. Every lot of cards must undergo one or more operations on several types of machines.
3. Dependent processes, i.e. those which cannot be performed until previous operations have been completed.	3. Most tabulating systems are made up of several steps which must be performed in a definite sequence.
4. Variations in machine capacities depending upon the work.	4. Output of the major machines varies according to the kind of operation being performed, i.e., holes punched, read, cards passed, lines printed.
5. Sub-assembly operations.	5. Various sub-groups of cards are mechanically assembled and processed before they are merged with the main group at fixed points in the production process.
6. Specific time requirements.	6. Regular and special jobs with specified completion dates occur frequently.
7. Production in "small lots."	7. Many jobs, particularly those of a daily performance frequency, are characterized by the receipt of many small lots of cards.

its source, through individual work stations, to its ultimate destination. Scheduling sets forth the relative or absolute times at which each job is to be started and, as deemed desirable, the time at which each component operation is to be performed.

Performing includes dispatching, instructing and expediting to meet the plans as well as recording actual performance. Dispatching initiates action on individual jobs in terms of route and schedule. Instructing insures performance in a predetermined series of operations. Expediting keeps the jobs moving in terms of the availability of manpower, machinery, space and materials, with reassignment of operations sequences and work stations as needed to speed processing.

Reporting consists of recording and documenting actual performance and comparing that performance to plan. Recording sets down work volumes and times in such categories as normal production, reruns, breakdowns, receipts and releases. Comparison consists of variance reports embodying various levels of detail for different levels of management.

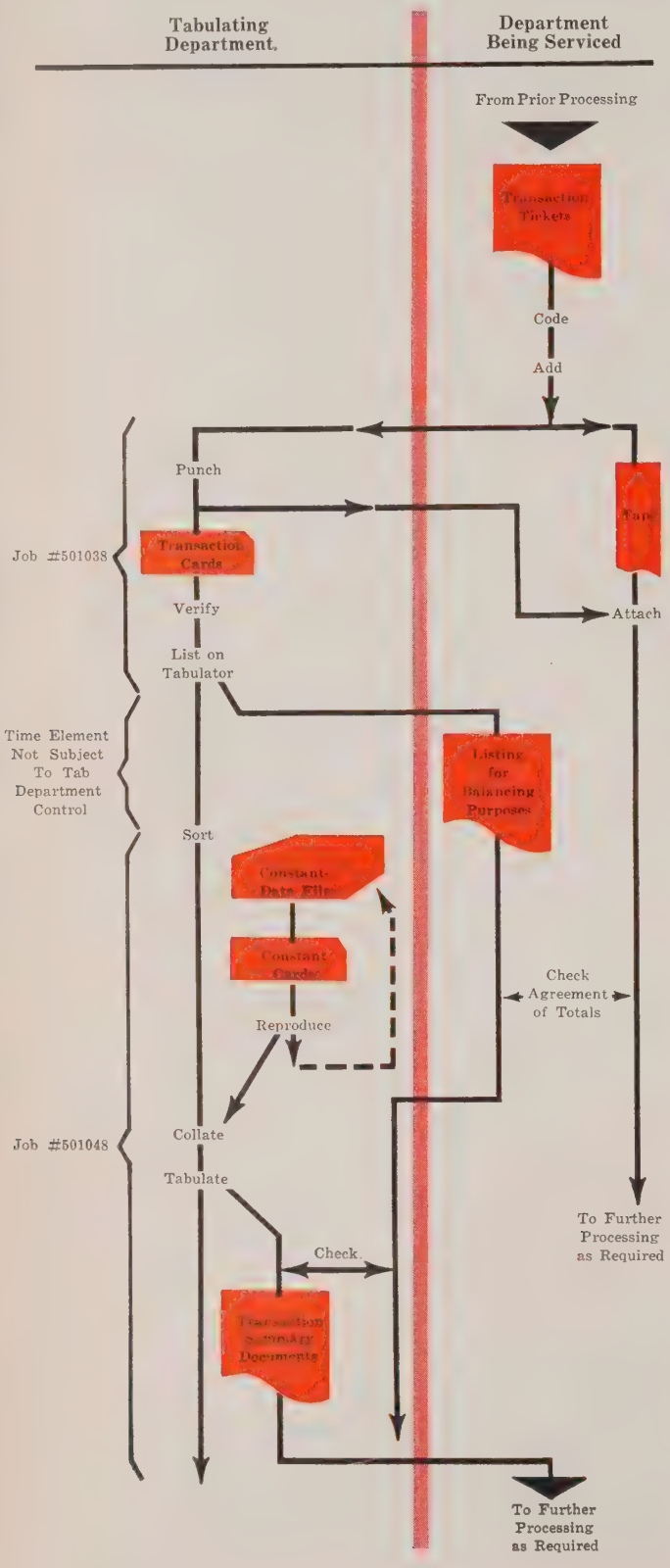
The characteristics of a well-managed data processing installation utilizing these procedures are easily recognizable:

- Optimum utilization of equipment, personnel, materials and office facilities.
- Adherence to established due dates for transaction documents and management reports, and to commitment dates for special jobs.
- Application to the system of only such work as can be performed more efficiently by the punched card method than by other office work methods.
- No duplications in reports coverage and distribution.
- Reduction of work-in-process time.
- Generation of accurate cost data.
- Accurate forecasting of personnel and physical resources needs.
- Operator flexibility.

The development of a production control system

Exhibit 2

Skeleton Flow Chart Illustrating the Formation of Jobs



which will achieve these characteristics is a full-time job of several months' duration in any but the smallest machine accounting operation. It is probably due to this fact, rather than to the inability or lack of initiative on the part of machine accounting management, that the dearth of effective controls can be attributed. This time requirement suggests a need for assistance from the company's systems department or from outside.

The first step in a program to develop effective control is a thorough analysis of present operations. Design of the control program within a reasonable length of time, however, requires that the analyst works simultaneously in several areas. He may at the same time, for example, be directing the construction of basic flow charts, designing a job ticket and working out a set of control reports. For simplicity of description, though, it is helpful to treat the major system segments of planning (covered in this article), performing and recording (to be covered in subsequent articles) as though they were being developed as discreet components.

The formation of jobs

Planning punched card operations in any but the most elementary machine accounting installation requires considerable effort. The unit of work to be used for scheduling purposes must be established and given identification coding; the machine and clerical operations performed by the machine accounting department must be classified; time and place requirements for the various inputs and outputs must be established or reaffirmed with the departments concerned; and production time standards adopted. Finally, the content and format of the planning tools must be determined, and the mechanism for schedule preparation and change set in motion.

Each work unit, or "job," (shown in Exhibit 2 at the left) as conceived for scheduling purposes, must be readily identifiable, controllable in its entirety by machine accounting management and should produce a result which can be allocated to some major segment of company work. To this end, a job can be defined as any configuration of machine and clerical operations which meets certain criteria:

- Occurring in a fixed frequency, such as daily, weekly or monthly.
- Involving only one major activity, such as accounts payable.
- Involving where work is cycled, a single cycle.
- Performed from beginning to end without need for additional instructions or materials from outside the job.
- Performed through serial rather than parallel operations.

A job should produce one or more of the fol-

Exhibit 3

Equation A:

$$\frac{\left(\begin{array}{c}\text{Volume}\\ \text{of Input}\\ \text{Cards}\end{array} \times \begin{array}{c}\text{Number of}\\ \text{Passes Per}\\ \text{Input Card}\end{array} \times \begin{array}{c}\text{Number of}\\ \text{Cycles Per}\\ \text{Pass}\end{array}\right) + \left(\begin{array}{c}\text{Volume of}\\ \text{Summary}\\ \text{Cards}\end{array} \times \begin{array}{c}\text{Number of}\\ \text{Cycles Per}\\ \text{Summary Card}\end{array}\right)}{\text{Rated Hourly Speed of Governing Machine}} = \begin{array}{c}\text{Standard}\\ \text{Running}\\ \text{Time in}\\ \text{Hours}\end{array}$$

Equation B:

$$\left(\begin{array}{c}\text{Make-ready}\\ \text{and Put-away}\\ \text{Constant}\end{array}\right) + \left(\begin{array}{c}\text{Number}\\ \text{of Card}\\ \text{Passes}\end{array} \times \begin{array}{c}\text{Per Pass}\\ \text{Constant}\end{array}\right) + \left(\frac{\text{Number of Input Cards}}{500} \times \begin{array}{c}\text{Feed Hopper}\\ \text{Replenishment}\\ \text{Constant Per}\\ \text{500 Cards}\end{array}\right) = \begin{array}{c}\text{Standard}\\ \text{Running}\\ \text{Time in}\\ \text{Hours}\end{array}$$

lowing results: a report; transaction documents, such as checks; or a deck of punched cards to serve as input to another machine accounting job, scheduled for production in parallel with the original job, at a different time or upon receipt of materials or information from outside the job.

The term "job," as informally used in most tabulating installations, does not conform to these qualifications. However, these criteria are essential not only to scheduling, but also to routing, dispatching and expediting.

Machine accounting products, no matter how carefully defined, are usually called different names by various people. Sometimes these names are quite exotic, like "towel run," "pink sheets" or "blue book." Even under a controlled system, the use of such names will continue.

Cyclic accounting

Because we intend to use machines to control their own operations, however, we also must identify the units of work by job numbers. Normally, six digits are sufficient to construct a code number which will tell us all we need to know about the job.

The first digit position should be used to specify the frequency of job performance, and might be utilized like this:

Frequency	Code
Daily	1
Weekly	2
Biweekly	3
Semi-monthly	4
Monthly	5
Quarterly	6
Semi-annually	7
Annually	8
Irregularly	9

The next two digit positions should be used to code the major class of work or the function to which the job belongs. For example:

Major Class of Work	Code
Accounts receivable; sales distribution	01
Accounts payable; purchase distribution	02
Payroll; labor distribution	03
General ledger accounting	04

The last three digit positions should be used to generally identify the job. For example:

General Identification	Code
Office payroll	300
Purchase journal	150
Machine breakdown	998
Rerun	999

Unlike the first three digit positions of the job number, the last three normally do not play a part in the actual control processes. Where cycle

Exhibit 4

SETUP CONSTANTS

Manufacturer's Machine Designation	Machine Type	Constants (Hundredths of an hour) Make-Ready And Put-Away	Rehandling During Operation	Feed Hopper Replenishment (Per 500 cards)
063	Card-to-tape	.03	. . .	.01
082	Sorter	.03	.02	.01
083	Sorter	.03	.02	.01
085	Collator	.07	. . .	.01
088	Collator	.07		.01
407	Tabulator	.08		.01
408	Tabulator	.17		.01
419	Tabulator	.15		.01
519	Reproducer	.05		.01
523	Reproducer	.05		.01
528	Reproducer	.05		.01
557	Interpreter	.03	.01	.01
604	Calculator	.07		.01

Exhibit 5

Sample Production Schedule

WORKING DAY DUE IN	JOB NO.	JOB TITLE	SEQUENCE OF OPERATIONS				WORKING DAY		REMARKS
							DUE OUT	SENT OUT	
3	101001	Batch-balance daily charges	X	T			3		
	408002	Balance check-issued cards	R	R	T	R	5		
6	101001	Batch-balance daily charges	X	T			6		
	523010	List A/R statements, cycle 0	R	R	T	R	8		
8	101001	Batch-balance daily charges	X	T			8		
	214002	Run remittance cash report	C	C	T		9		

X = clerical operation R = reproducer
T = tabulator C = collator

Exhibit 6

TABULATING JOB CONTROL CARD

DATE INITIATED _____
REVISION NUMBER _____ DATE _____

JOB CODE NUMBER	PERFORMANCE FREQUENCY: CODE	PERFORMANCE FREQUENCY: SPECIFIC DAYS, WEEKS, ETC. (IF "ALL", SO STATE)	JOB TITLE:	PROCESS FLOW CHART (✓)	JOB INSTRUCTION FOLDER (✓)	TABULATING–EXTERNAL
				☐	☐	IN / OUT

TOTAL STANDARD HOURS AND TENTHS BY CLASS OF MACHINE AND COMBINED CLERICAL STEPS

																	CLERICAL	GRAND TOTAL

TABULATING–INTERNAL

PUNCHED CARDS	FROM:	OUT
	TO:	OUT
OTHER MATERIALS	FROM:	OUT
	TO:	OUT

JOB STEP	MANUFACTURER'S MACHINE CLASS	MACHINE SYMBOL (E.G. S = SORTER)	DESCRIPTION OF JOB STEP	VOLUME OF CARDS	NUMBER OF PASSES	STANDARD HOURS AND TENTHS PER STEP: RUNNING	SET-UP	TOTAL	REMARKS FOR SPECIFIC STEPS
01									
02									
11									

billing or other cyclic accounting is employed, however, the actual cycle number might be used in the sixth digit position. All jobs associated with cycle eight then would end in an eight; the monthly statement preparation for accounts receivable billing cycle eight might bear the number 501038, indicating the following information:

5—Performance frequency (monthly).

-01—Major class of work (accounts receivable sales distribution).

-038—General Identification of billing operations within cycle eight.

After establishing job conception and coding, comes the task of classifying the work of a going machine accounting installation in job terms. The grouping of related operations into jobs can be simplified through use of procedure flow charts.

These charts usually will include two or more jobs, as defined above. Sometimes they will include fractions of many jobs.

I TU 22

As each chart is reviewed, those operations which, when grouped, fit the aforementioned job criteria should be bracketed and annotated with an appropriate job number. Where fracturing occurs, it may be necessary to draw a new chart. If so, the new chart should be carefully cross-referenced with the old, in order that any operational detail accompanying the existing chart can be utilized subsequently in describing job steps. If new charts are drawn, the analyst should be certain to assign an individual flow line to each item of input and output, so that all contact points with other jobs and with extra-departmental routines will stand out. Thus, all charted operations should be appropriately regrouped, bracketed and identified by job number.

Sources and destinations of materials for machine accounting department operations may involve another department, another job or the machine accounting files. In most installations, at least some of these inputs and outputs must meet specific deadlines. Sometimes these deadlines are quite flexible and may be known only to a machine operator and his outside "contact." Regardless of how vague or how personalized, however, all deadline, source and destination data must be gathered and noted next to the appropriate symbols on the flow charts.

A convenient notation for entering deadline information utilizes a five-digit code. In the first digit position, a letter indicates the machine accounting organizational element which is to receive input or disperse output. In the second and third digit positions is entered the number of the day of the month or, if applicable, the first two letters of the day of the week. In the last two digit positions is entered the hour of the day (using a 24-hour clock or, if the timing is not that precise, 33 for a.m., 44 for p.m. and 55 for any time within the day). A job due into machine accounting (T) any time during the afternoon of the twenty-third day of the month could be identified "T2344." Using "I" as the code for "internal," a job to be started each Tuesday (TU) at 10 p.m. from cards that had been assembled throughout the previous week in machine accounting's own files might read *"I TU 22."*

In establishing these deadline data, the analyst should avoid lengthy discussions with other departments, since presumably machine accounting management does not yet have available the production time standards needed to insist on reasonable time differentials between the receipt of raw data and the delivery of final products.

If one principle, more than any other, should be adhered to in the development of production time standard's, it is that of keeping running time separate from setup time. This will greatly increase the applicability of measurement criteria because running time, or machine cycling, remains constant for a given operation regardless of where or when performed, while setup will vary with the effectiveness of existing methods. We are using the term "setup" to include "make-ready" and "put-away" work of any type other than actual machine running. The loading of a hopper, if the machine must be stopped to do so, should thus be regarded as "make-ready" time.

The running time for any given machine operation can be derived from Equation A, Exhibit 3.

Stop watch study

It is recognized that the determination of a realistic volume figure on some jobs is difficult. Therefore, in future variance reporting, provision is made for segregating time variances due to volume from those due to efficiency.

The setup time for any given machine operation in a job is derived from the use of Equation B, Exhibit 3, and the related illustrated table of constants shown in Exhibit 4.

The total standard time for each machine operation in a job, is, are equal to the sum of the standard running time and setup time in hours The total standard hours for clerical operations occurring within a job can be established by work sampling, stop watch study or any other form of work measurement deemed appropriate for the particular production situation.

Values for the constants are the result of the

Continued on Page 64

Society of the Divine Savior data processing center.

Faith, Hope and Computer

By Donald Young

AIDED by the most sophisticated use of ultra-modern electronic data processing equipment, the world's most efficient, most effective direct mail operation is used to raise funds for the charitable activities sponsored by the Society of the Divine Savior, an order of the Catholic Church dating back to 1881. These charities include the support of seven American seminaries, numerous foreign missions, three Southern Negro missions and five American Indian missions.

Headquartered in a one-story, 45,000-sq. ft. building on the outskirts of New Holstein, Wis., 80 miles north of Milwaukee, the Salvatorian Center—fund-raising and public relations center for the Society—prepares, prints and issues eight to 10 million pieces of mail per year.

But the most unusual aspect of this operation is not its volume; not the fact that it is conducted by and for the church; and not the fact that it is conducted in a tiny Wisconsin dairy farming community of 2,400 population. It is the fact that the results of the operation have been so fantastically productive.

While most commercial direct mail campaigns are pleased with a five to 10 percent return—and 50 percent is considered phenomenal—some of the mailings from the Salvatorian Center will draw an unbelievable 80 percent response. A "first time" mailing will produce an average return of 27 percent.

The key to this remarkable record is the center's mailing list. Like any other direct mail operation, the center depends upon its mailing list; the better the list, the more efficient the mailing and the more profitable the return.

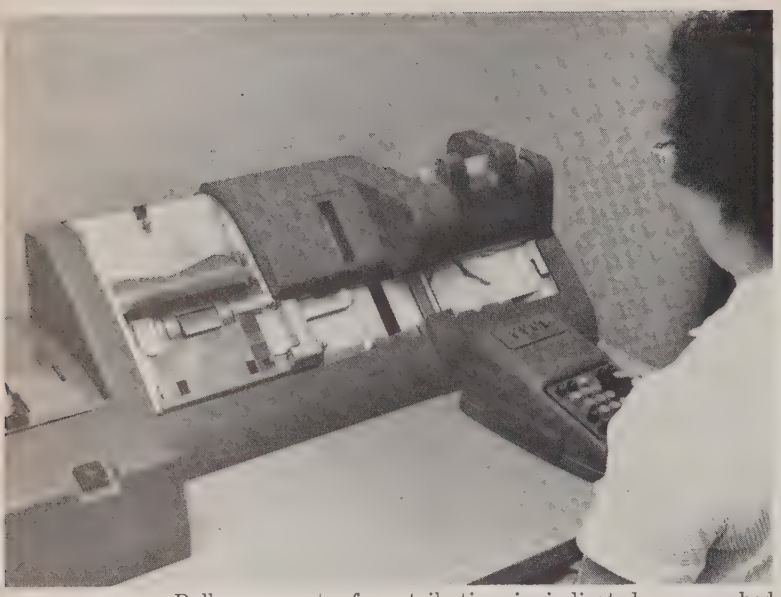
Unlike most lists, the Salvatorian list is not a mere directory of names and addresses, but a carefully-controlled collection of "personal histories" on every one of their past benefactors. Recorded and maintained on magnetic tape, each of these histories contains 341 characters of coded information on the donor, including when he was last solicited, how long it took him to respond, the type of appeal to which he responded, the size of his contribution, his total donations during the year and similar data. Some 30,000 personal histories are maintained on each single reel of magnetic tape and all reels are screened every time the center is ready to make a direct mail appeal.

Current benefactors help build the Salvatorians' mailing list by giving the center the names of those whom they believe will be interested in donating to its work. The center compiles its own lists in this manner without the aid of outside promoters, and its lists are never sold or rented to other interests.

Appeals take many forms. Some are simple requests for monetary assistance; others are promotions of some product, such as cheeses, Christmas cards, gift wrappings or religious artifacts.

"With our taped record of benefactors' donations throughout the years, we can pre-determine

Father Alfred Schmidt, executive director of the center reflects his pleasure with the A-M Series 900 data processing system.



Dollar amount of contribution is indicated on punched card returned by contributor and punched into card on IBM card proof punch (above). An adding machine tape is produced and verified by tape totals to control totals prepared by revenue clerks. Data from punched cards is converted to magnetic tape on the A-M card reader (right).

how we're going to make out on a given solicitation with considerable accuracy," says Father Alfred Schmit, executive director of the Salvatorian Center. "By electronically sorting through our files, we can pick out a choice mailing list comprising names of donors whose past histories indicate that they will be receptive to the type of appeal we have in mind. That way, we can direct our appeals more accurately, thereby keeping our costs to a minimum, with the desirable result that a greater portion of every donated dollar goes directly to the charitable work for which it was intended."

This charitable work includes the support of the Society's 1,000 students at seminaries in St. Nazianz, Wis.; Sioux City, Ia.; Blackwood, N. J.; Colfax, Ia.; Lanham, Md.; Galt, Calif.; and Menominee, Mich. It also includes the support of Negro missions in Phenix City, Ala.; Huntsville, Ala.; and Columbus, Ga.; of Indian missions in Grande Ronde, Jordan, Lyons, Scio and Jefferson, Ore.; and of foreign missions in Tanganyika, Formosa and the Congo.

As a fund-raising medium, the use of direct mail is not new to the Society of the Divine Savior. The Salvatorians sent out their first appeal for financial assistance in 1920 by mailing a few handwritten letters to personal friends. Later, as the number of benefactors grew, typewriters were purchased and employes were hired to prepare typed letters of solicitation; names and addresses were maintained on 3x4-in. file cards.

In 1950, the file cards gave way to punched cards and tabulating equipment. In January 1959, an IBM 650 magnetic tape system was adopted. This was replaced in November 1960, when an Addressograph-Multigraph Series 900 electronic data processing system was installed—the first of its kind in the country.

The heart of the Series 900 system is the 943 file processor. It is externally programmed by means of control panels to read, write and compute data in unit or grouped record format simultaneously, and it features core storage and fully-transistorized arithmetic and logical devices in modular form. Multiple decisions may be effected in parallel.

A personal "thank you"

The Series 900 tape transport units are used on-line. Up to four may be used as separate inputs, and up to 10 used as outputs.

The system's card reader will operate at speeds ranging from 250 to 750 cards per minute and it will handle either 80 or 90-column cards.

The A-M 950 off-line stylus printer produces 60,000 complete four, five or six-line address labels per hour, while the A-M 960 high speed line printer installed at the center produces 600 or 900 lines per minute, off-line.

Addresses selected from the magnetic tape mailing list are printed out on a reverse carbon strip. These strips are inserted directly into the mailing

Each roll of magnetic tape, being inspected above, contains personal histories of 30,000 contributors. Tapes control printers which prepare a reverse carbon strip-listing. Banks of Auto-Typists (right) are used to acknowledge all contributions with a personalized note.

department's addressing machine (an A-M Model 831 transfer printer) and converted to direct address images. This creates the impression that the envelopes have been individually type-addressed and not merely labeled.

When incoming mail is received at the Salvatorian Center, it is mechanically dated and slit open. Revenue clerks check the contributions against response cards, which are returned with the donations, and the cards are then sent through an IBM card punch proof, which prepares an adding machine tape as the operator punches in the amount of the contribution. A separate adding machine tape is run on the cash itself for balancing purposes.

Returned response cards and the document listing the names of potential new donors, which are to be added to the mailing list, are processed through keypunches. Every week, the master tapes of donors' histories are up-dated with information obtained from these cards. The information is converted to magnetic tape in random sequence at 600 cards per minute, then sorted into donor sequence.

New donations, address changes, new names, names to be deleted from the list and similar changes are recorded on new master tapes. The old tapes are stored for two weeks so that, in the event anything were to happen to the current master tapes, two previous sets of tapes containing information not more than two weeks old would be available to continue operations.

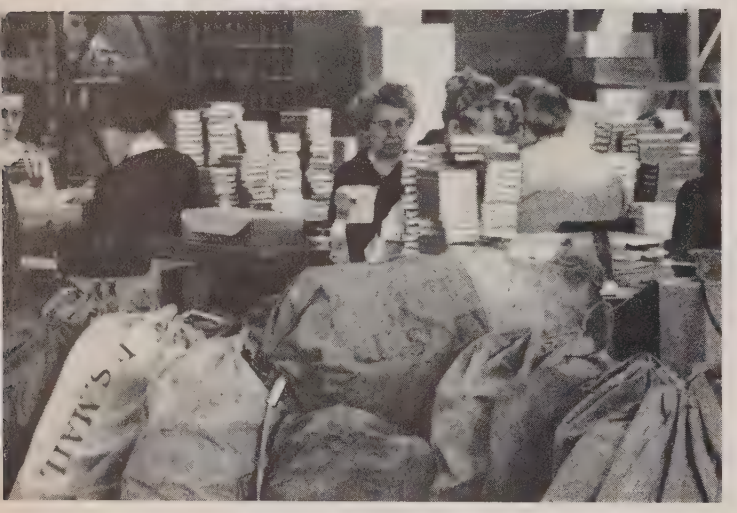
If a benefactor has sent in a donation, a punch on his returned response card will cancel out a coding in the master file as this weekly updating process is accomplished. If the benefactor has not sent in a donation, however, the coding remains on the tape and every 30 days these names are sent a follow-up appeal.

Reminders are sent out as part of a standard procedure at the Salvatorian Center, as are letters of acknowledgement for all donations. The latter are prepared on seven batteries of automatic typewriters which produce "personally" typed "thank you" and not a routine form letter. To sign this vast bulk of mail, Father Alfred's "personal" signature is affixed to each letter by one of three Autopens, an instrument designed to follow the outline of an irregular program wheel and reproduce the signature, as if it were personally signed.

Stuffed, sealed and bundled

The data processing and acknowledgement departments are just a part of this compact organization, dedicated to the most efficient conduct of direct mail solicitation. Other departments include accounting (which receives incoming mail and controls all revenues collected); printing (where all direct mail literature is prepared); binding; stock and warehouse; mailing; and all correspondence files.

The entire organization is geared to the limits



Mailings are stuffed, sealed, addressed and stamped automatically (top picture). These operations are geared to an output of 100,000 pieces a day.

of its daily output, which has been set at 100,000 pieces. Printing is done on offset presses; all mailings are machine stuffed, sealed and bundled.

Included in this output are two magazines, edited, printed and distributed at the Salvatorian Center. *Catholic Youth* is a children's magazine for youngsters 10 to 14 years of age. It is published 10 months a year, excluding July and August, and has a circulation of 50,000 to 60,000 copies per issue. *Salvatorians* is a digest-sized news medium for contributors to the Society. It is published five times a year and reaches over 50,000 persons per issue.

Due to the tremendous volume of mail pouring out of the Salvatorian Center, the organization has been classified by the Post Office as an independent contract station. Its mailing address, although the center is located within the village of New Holstein, is officially listed as simply: "Salvatorian Center, Wis." Mail trucks back up to the building and transport mail from there just as they do from the regular post office in town.

The Salvatorian Center employs the services of three priests (Father Wigbert Lainweber, S.O.S., Father Alfred Schmit, S.O.S. and his assistant, Father Roy Mollen, S.O.S.), six Brothers (a Brother is a layman, specially prepared to serve the Salvatorian priests through their specialized skills in many fields) and 94 lay personnel—80 full-time and 14 seasonal employes.

A bronze plaque

Four of these people are employed in the computer room. Additional help is used in the operation of the 12 card punches that are required to keep up with the tremendous volume of work that passes through the center. During the peak season, as much as 80,000 pieces of incoming mail are received and processed weekly.

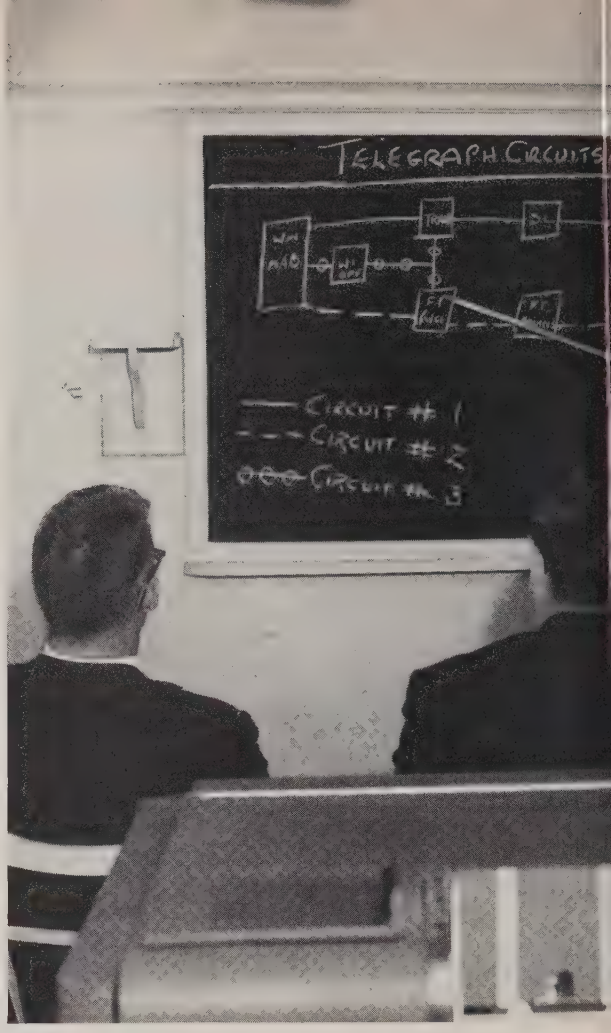
Although 60 percent of the available time in the Salvation Center's data processing department is devoted to fund-raising reports and analyses, many other duties must be performed by the center's staff. These include the maintenance of numerous records associated with the fund-raising activity. For example, anyone who contributes $365 toward the support of a boy's seminary education (the amount needed to maintain that boy for one school year) is invited to attend the boy's First Holy Mass and Ordination. This requires careful record-keeping.

Anyone who contributes $500 to one of the Society's seminaries may have his name inscribed on a bronze plaque affixed to one of the seminary rooms as a memorial. This also means additional recordkeeping problems.

"Obviously," says Father Alfred. "In supporting the work of the church, we must be as cost-conscious as we possibly can. We utilize every means of cutting our expenses and increasing the profit of our operation—even to the point where we screen all of our incoming mail and sell the stamps to a commercial broker.

"Therefore, if we invest $12,000 per month in the rental of Addressograph-Multigraph equipment to make our job easier, faster and more efficient, you can be sure that it's money well spent. We've investigated every available alternative and have decided that this is the most economical way to get the job done."

In addition to direct mail applications, all general accounting work will be added to the A-M 900 system. Some 24-hours a week will be available for these applications. ■



EDP's Working On the Railroad

A colorful old railroad car of the past, housing the business machines of the present, is being used by Canadian National Railways to train data processing personnel throughout Eastern and Central Canada.

Equipment carried by the instruction car includes two keypunch machines, two Transceivers, a sorter, a card-to-tape converter and a 402 accounting machine. This setup is equivalent to that used in the day-to-day collection and transmission of business data from 20 yard offices to the main data processing center in Montreal.

To transport trainees to Montreal and provide for them during their training period there would be quite expensive. It also would be more time-consuming and upsetting, both to the employe and to the Montreal office.

Instead, Canadian National has rigged up one of its old passenger cars, hitched the car to a passenger train and taken their data processing equipment to the trainees wherever such training has been needed. The car is left on a convenient siding near the local terminal and a schedule is arranged for the chosen trainees to attend classes.

Two instructors follow a training course outline with time allocated for machine operations, revising procedures and practice. Usually, there are seven students to a class who are introduced to the equipment, follow practical procedures of keypunching information into cards, and send and receive it as though they were in one yard sending advance information to another.

The 40-hour course is held during normal working hours and trainees receive their full pay while in attendance. Verbal and written tests are conducted and trainees who attain the necessary marks are qualified to fill new positions as they become available.

Novel visit to Lennoxville

The instruction car has been placed at the disposal of the railroad Transportation Department for their supervisors to use in training additional personnel as required for installation of new and larger equipment and in training periodic replacements as they are needed.

In addition to its training function, the car is

Railroad yard staffers go to school in the quaint old parlor shown at the extreme left. Canadian National Railways instruction car is equipped with a complete set of punched card machines, an accounting machine and transceivers such as those used at some 20 outlying yard offices.

used for demonstrations, familiarizing officers and supervisors with new methods and systems before they are put into use.

The old-fashioned, wooden-sided, curtain-windowed railroad car also has done its share of public relations for Canadian National. One of its more novel visits was at Bishops University in Lennoxville, Quebec, 100 miles from Montreal. During the instruction car's stay there, students played the IBM 650 management game by "remote control." Decisions were made by the participants, their choices were punched into cards and sent by Transceiver to Montreal, duplicate cards were punched there and fed into the computer to determine the outcome of the students' decisions. The next stage of the game was wired back to the instruction car. All of this was done in a matter of minutes, so that students could then go on to future rounds of play with their previous decisions already calculated.

This method of sending and receiving data is much like that in which the Canadian National conducts its actual business from line yards to data processing center; controling freight car movements, preparing semi-monthly payrolls involving 80,000 paychecks and maintaining its vast and everchanging inventory.

As many as 40 people are trained at one yard, gaining experience in the use of all types of equipment. Since September 1958, when Canadian National first initiated the training program in conjunction with the installation of an IBM 705 computer system, the instruction car has travelled over 18,000 miles and trained over 400 employes.

A busy car

The Canadian National instruction car keeps pace with the railroad's constant development in data processing. Since the first IBM 705 was installed, two more 705's and a 650 have been added. In September of this year, Canadian National further expanded its data processing system with the installation of an IBM 7080, first of its kind outside the United States.

The instruction car is expected to keep busy, training additional personnel for this installation and for others in the years to come. ■

At any remote location, a 1001 Data Transmission Unit reads punched cards and transmits the information over regular telephone lines.

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... new low cost way to send punched card data ... by telephone

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And it does it at low cost.

A simple, desk-top 1001 Data Transmission unit and telephone at each remote location plus a telephone and card punch at your data processing center put you in business. The operator at the remote unit dials the data processing center, inserts a punched card into the transmission unit, adds additional information with the simple keyboard, and presses a button.

The rest is automatic. The equipment reads the card, transmits the information over your regular telephone lines, and reproduces an identical punched card, ready for processing. You can connect a number of departments, plants, offices or customers with this 1001 Data Transmission System.

This is another example of IBM TELE-PROCESSING* Systems which help business act faster by speeding up collection of the facts on which action is based. TELE-PROCESSING Systems are available for coordination of anything from a warehouse to an entire company.

*Trademark

At the data processing center, an IBM Card Punch receives data by phone and automatically punches it into a card, ready for processing.

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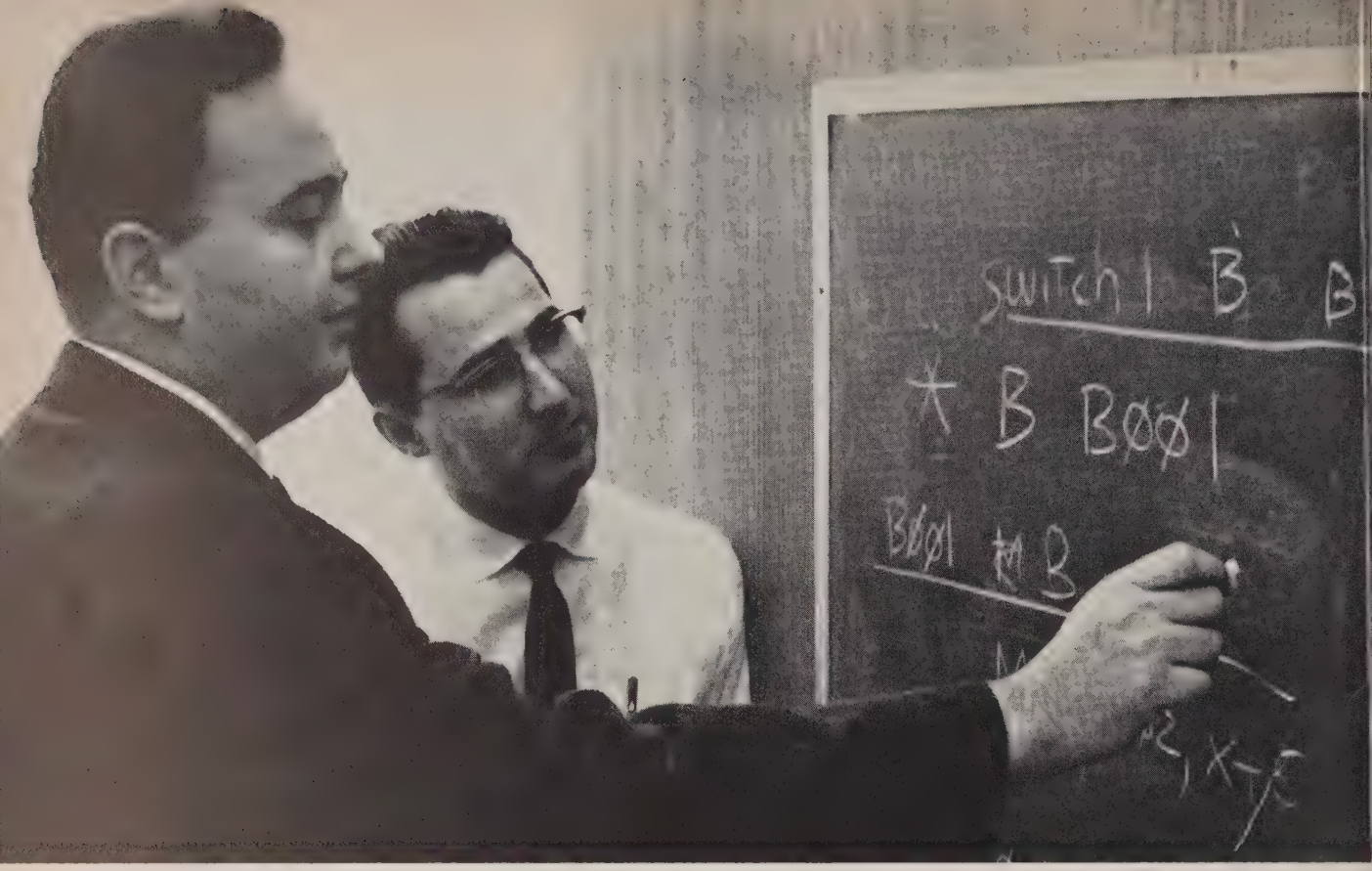


Originator of the Codematic system of programing, Ed Valliere, Jr., explains a detail to an associate.

Programing For Cosmetics

Codematic, an ingenious computer routine, has reduced programing time by 50 percent at Helene Curtis Industries. Developed by Ed Valliere, Jr., computer programing manager, after much frustration with the routines supplied by the computer manufacturer, Codematic has made it possible for Valliere and his assistant to program and maintain some 110 applications for Helene Curtis' two IBM 650 card computer data processing systems.

The Chicago-based giant of the beauty products field relies heavily on the round-the-clock operation of its modern machine accounting department to supply important statistical support for control over a mounting sales volume which this year will probably top the $60 million figure.

Computer applications include payroll, orders, billing, accounts receivable, sales analysis, accounts payable, quota reports, inventory control, cost accounting, labor analysis, general ledger, financial statements and other miscellaneous jobs.

Codematic is an automatic optimum address coding program. It is based on the use of actual 650 machine language coding instead of symbolic or interpretive routines.

Comparing his system to SOAP, the automatic 650 routine developed for customer use by IBM, Valliere contends that Codematic not only simplifies program writing, but that finished programs are easier to read, trace and debug at the computer console. The system uses standard cards and maintains present standards of programing techniques, including block and card numbers and starting instructions. It has the ability to add or change programs with a minimum of complication and delay.

Basically, all that is required to program with Codematic is to write the block number, operation code and data address. Only in case of branching, constants and modification is the location or next instruction ever written. After keypunching—one word per card—the program can be processed with Codematic on any standard 650. Two passes are necessary: one to initialize; the other to optimize and produce the finished program load cards. (For examples see pages 32 and 33.)

Since 1934, when Helene Curtis first joined the ranks of pioneer users of punched cards, the 80-column card has played an increasingly vital role in the company's rapid rise to prominence in the toiletries industry.

The "total" use of punched cards at Helene Curtis is due in no little part to the keen interest in tabulating exercised by Max H. Braun, vice president, and Edwin G. Ross, controller. Mr. Braun is a veteran of the punched card business, having installed one of Chicago's first tabulating systems at the Chicago Motor Club in the early 1920's.

Door-to-door cosmetics

Helene Curtis Industries now has five main divisions. Its International division handles licensing agreements with manufacturers in 35 countries and sells through distributors in 29 others. Its Beauty Salon division is the world's largest supplier of beauty shop equipment and preparations. The Products division, which moved Helene Curtis into the retail toiletries field in 1949, is now the largest in sales volume. The women's perfume and cologne Lentheric division, the popular Kings Men division which handles men's toiletries are two more. The recently acquired divisions include Studio Girl-Hollywood, a nation-wide door-to-door cosmetic organization; the new Curtis Pharmaceutical division marketing allied products to the drug field; and Plastic Products Co., manufacturing for drug and hardware outlets.

All data processing for the five divisions is handled by the firm's 22,000 point installation. (One point is equivalent to a dollar of monthly machine rental). The man who heads the installation is Ed Valliere, Sr., a veteran of some 27 years in the punched card field. He has a staff of 40 people.

One of the most important applications is order-billing which involves 35,000 customers and results in over 350,000 invoices annually.

Order writing begins with the pulling of prepunched customer name and address cards, plus cards with shipping and billing information.

"Pallet identification"

Prepunched product cards are also pulled and the quantity ordered is mark sensed on the individual cards. These penciled quantities are converted to punched holes on a reproducing punch and the entire set of order cards are then processed through the 650.

The computer determines the trade class or division of the product involved and the unit price. It extends quantity by unit price to determine dollar values. Quantity ordered is divided by the unit pack to arrive at the number of cartons. This figure is multiplied by weight to obtain the total weight per item. All of these calculations are punched into the order cards which are then used to prepare an eight-part order form on an IBM 407 printer.

Some of the five divisions ship collect and some prepaid. To enable the order form to handle both possibilities, the bills of lading portion is preprinted with a signature, necessary for a collect shipment. If a prepaid order is involved a code in the order card causes the 407 to overprint on the signature. This allows the bill to be used for a prepaid shipment.

After preparing the order, the cards are held in an "on order" file. The order form, minus the eighth part, which is retained in the sales order department, moves to the warehouse with carbon intact. After the order has been filled the date shipped, and shipper's number, are entered on the seven copies by means of a Cummins Perforator. The original copy, labeled "Shipping Report," is returned to the billing section while the other copies are used for various shipping purposes.

Upon receipt of the shipping report the billing department selects the cards from the file and forwards them to a keypunch operator. Here the cards are coded as to complete shipments, back orders, incomplete or overshipments, and cancel-

"Codematic" Operation Outline

1. Write program in standard 650 numeric coding, assigning block numbers, operation code, data address and general block description.
2. Write the location and/or next instruction only for standard read, starting location, branching, constants and special modification routines.
3. Do not use any locations in the 00-99 and 1900-1999 bands. They may be used for the data address in a read or punch area.
4. Maximum program length is 1800 instructions.
5. To reserve locations for inter-accumulations, tables, etc., punch a special reservation card for each area: X in column 20; lower limit columns 23-26; upper limit columns 37-40.
6. Keypunch, from coding sheet, the program into standard one word per card load cards. Leave blank any fields not written.
7. Zero drum.
8. Set console 70-1951-1903.
9. Load Codematic 533.
10. Run in program, with reservation cards at end. If the 01 stop is encountered, this indicates a location used more than once; correct and restart.
11. Change console to 70-1951-1905.
12. Set 533 emitter for problem number.
13. Run in program only, with a 9's ending card.
14. 533 will punch out completed load deck with card numbers assigned and all standard load coding. If description is desired, reproduce into columns 41-80 from input deck.
15. Program is ready for listing and testing.
16. To make changes or additions, prepare in same way as above to Step 10. Run in original load deck with additions to initialize. Then process additions only (13), reassemble and proceed.

Codematic Program

CARD NO.	LOC. INST.	OP CODE	DATA	NEXT INST.
001	1900	70	1951	1903
002	1903	69	1959	0037
003	0037	92	0042	0043
004	0042	65	1952	0057
005	0057	69	0038	0044
006	0044	22	0038	8001
007	0045	16	1955	0046
008	0046	45	0047	1900
009	0047	15	8001	0048
010	0048	15	0049	0057
011	0043	65	1952	1945
012	0038	20	0000	0045
013	0049	00	0001	0000
014	1945	45	1901	1900
015	1901	15	0006	1911
016	1911	20	1920	1904
017	1904	69	1941	1943
018	1943	22	1941	8001
019	1941	65	0000	1998
020	1998	45	1985	0088
021	1985	01	0001	9999
022	0088	69	1952	1920
023	1999	70	1951	1905
024	1905	65	1957	0050
025	0050	16	1951	1944
026	1944	45	1949	1950
027	1949	69	0002	1906
028	1906	24	1905	1950
029	1950	65	1977	1918
030	1918	15	0007	1912
031	1912	20	1977	1916
032	1913	24	1905	1908
033	1908	65	0007	1912
034	1916	65	1952	1946
035	1946	45	0076	0052
036	0052	69	0080	1933
037	1933	24	1978	1902
038	0076	69	1952	1922
039	1922	24	1978	1902
040	1902	65	1955	1948
041	1948	45	0059	0053
042	0059	20	0080	0087
043	0087	20	1980	0063
044	0053	69	1959	0096
045	0096	91	0059	0094
046	0094	69	1953	8001
047	1909	15	1956	0097
048	0097	15	0005	0099
049	0099	20	1910	8002
050	0055	45	1961	1914
051	1914	65	1910	1915
052	1915	24	1980	1919
053	1919	24	0080	0083
054	0083	69	0086	0091
055	0091	22	0086	8001
056	0086	20	0000	0063
057	0063	69	1953	1987
058	1987	24	1979	1988
059	1988	69	1954	1937
060	1937	24	1983	1947
061	1947	69	1951	1976
062	1976	24	1984	1917
063	1917	71	1977	1999
064	1961	65	1910	1924
065	1924	15	0027	1931
066	1931	20	1910	1932
067	1932	35	0004	1942
068	1942	11	0028	1934
069	1934	44	1910	0081
070	0056	45	1962	1914
071	1962	65	1910	1973
072	1973	15	0032	1931
073	0081	65	1910	1926
074	1926	16	0029	1935
075	1935	20	1910	1974
076	1974	35	0004	1985
077	1985	11	0033	1938
078	1938	44	1910	1940
079	0054	45	0079	1914
080	0079	69	1910	1936
081	1936	16	0032	1935
082	1940	65	1910	1975
083	1975	15	0034	1931
084	0010	65	0000	1909
085	0011	65	0000	1909
086	0014	65	0001	1909
087	0015	65	0000	1909
088	0016	65	0000	1909
089	0017	65	0000	1909
090	0018	65	0000	1909
091	0019	65	0001	1909
092	0020	65	0003	1909
093	0021	65	0003	1909
094	0022	65	0003	1909
095	0023	65	0003	1909
096	0024	65	0003	1909
097	0030	60	1956	0090
098	0031	60	1956	0090
099	0035	60	1956	0090
100	0090	19	0089	0039
101	0039	15	1978	0058
102	0058	69	0040	0077
103	0077	22	0040	0078
104	0078	24	1910	8001
105	0040	65	0000	0055
106	0060	65	0000	1909
107	0061	65	0000	1909
108	0065	65	0000	1909
109	0066	65	0000	1909
110	0067	65	0000	1909
111	0068	65	0000	1909
112	0069	65	0003	1909
113	0064	65	0001	1909
114	0070	65	0004	1909
115	0071	65	0004	1909
116	0073	65	0004	1909
117	0074	65	0004	1909
118	0075	65	0000	1909
119	0000	00	0005	0000
120	0001	00	0020	0000
121	0002	69	0008	1913
122	0003	00	0003	0000
123	0004	00	0010	0000
124	0005	65	0100	0055
125	0006	24	0000	1900
126	0007	00	0000	0001
127	0008	65	1957	0050
128	0012	00	0000	0000
129	0027	00	0050	0001
130	0028	00	0000	6519
131	0029	00	0049	0002
132	0032	00	0050	0000
133	0033	00	0000	6500
134	0034	00	0051	0002
135	0036	00	0000	0063
136	0013	00	0000	0092
137	1981	69	1954	1953
138	1982	24	0000	8000
139	1986	00	0000	8000
139	0089	00	0000	0007

Note: The following cards should contain descriptions as indicated: **Card Description** 001—Codematic 533: 002—Test Reserve Cd.; 007—Test Limit; 023—Codematic B; 026—Compare Block; 028—Change; 032—1905 69 0008 1913; 036—No Loc. Punch; 039—Set Switch 1; 042—NI Punch; 049—65 Loc. 0055; 050—Test Loc. Zero; 051—Zero; 053—Store for Loc. Next Cd.; 055—20 Loc. 0063; 064—Loc. NZ; 065—NI 50; 068—Test 1900; 069—65 Loc. 0056; 070—Test Zero; 073—Y 1900; 074—NI 50 Plus 1; 078—Test 0000; 079—65 Loc. 0054; 084—Constants; 128—Zeros;

ations. Postage and freight charges are also added at this time.

Once again the 650 takes over, analyzing the quantity ordered against the quantity shipped and correcting invoice extensions accordingly. Back Order cards are automatically prepared, as are cards for sales analysis, taxes and accounts receivable.

The 650 also checks the credit condition of each account, watching the balance due—or overdue—and the amounts exceeding established credit limits. When these conditions are not favorable the 650 creates a "stop order" and the order is referred to the credit department for action.

With the exception of stop orders, the header and item cards move from the 650 to the 407 printer for preparation of a five part invoice.

The order-billing procedure is much more complicated than this over-simplified summary indicates. In fact, it is one of the most involved and important applications in the company. Volume alone makes it a formidable task. Invoices and

orders average from 800 to 1,000 a day, amounting to some 700,000 per year. Card volume runs close to 30 million annually.

Another critical application at Helene Curtis is the inventory control system, and here again the 650 plays an important role. Over 30,000 "parts" go into the production of the various toiletry and cosmetic products, and the fast moving nature of the industry requires a tight control over inventory at all times.

Production orders for finished goods are keypunched and matched with a specifications card deck, which is comparable to a bill of materials. The 650 program determines if the items involved are to be manufactured or drawn from stock. If manufacturing is indicated the production is "exploded" and individual production orders created for the parts to be manufactured.

For material to be issued from stock, the 650 creates "issue" cards and a three-part "identification" tag. The latter is an IBM card with three stubs which provides for stock control. A "move ticket program" on the 650 enables Helene Curtis to determine in advance of production how many pallets will be necessary to store the quantities of each item to be manufactured. The program also produces "pallet identification" tags which are attached to the pallets as merchandise is produced. Mark sensed move tickets control the daily movement of merchandise from production and the material issues. A daily inventory report enables management to keep a close watch over all items.

A purchase order program on the 650 creates purchase receipt cards which are pulled and mark sensed from copies of receiving tickets. This same program maintains a balance due condition and handles adjustments to inventory.

The 650 also produces a periodic report enabling management to control the exponential "smoothing" of inventory levels. This report analyzes shipments and issues of all items and determines the optimum reorder point.

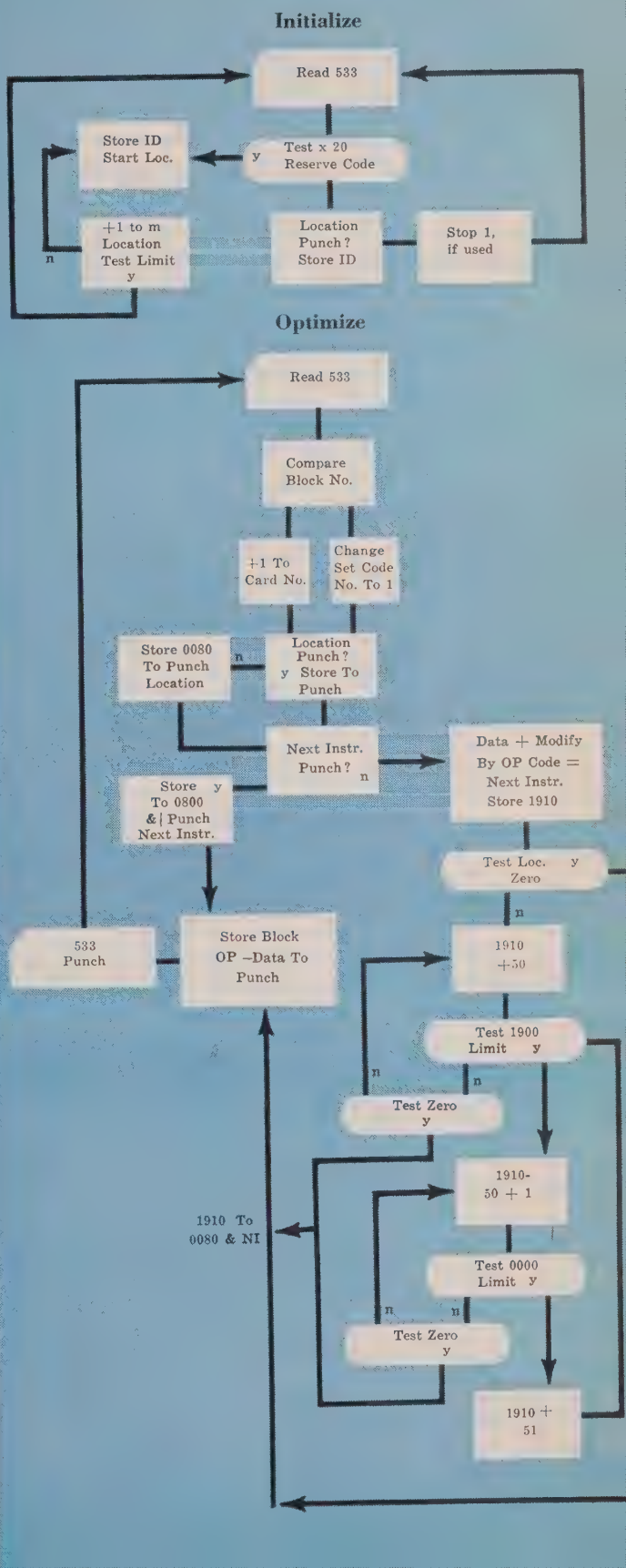
The rapid growth of Helene Curtis with accompanying new applications and volume growth in the old, have made it necessary to plan for expansion of the productive capacity of the machine accounting department.

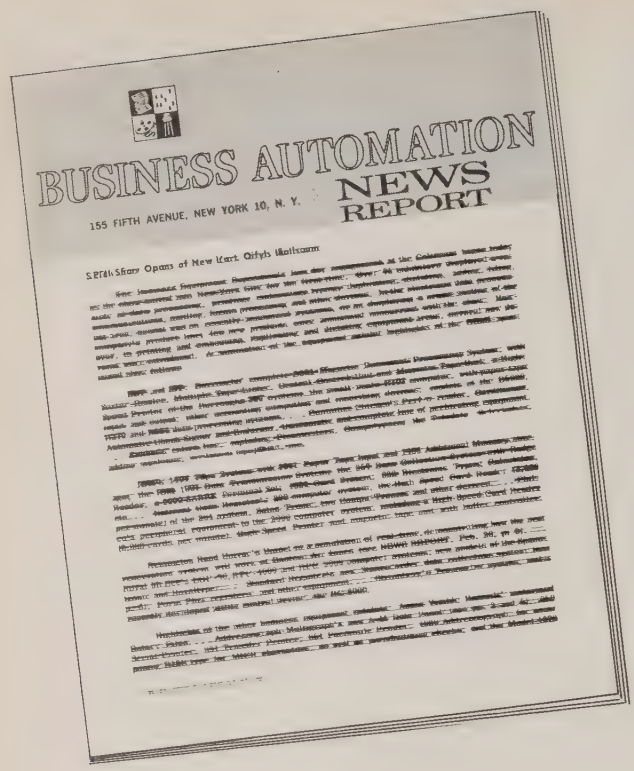
Management has approved the replacement of the two 650 computers with two 1401 and one 1410 IBM systems, utilizing magnetic tape. The system will have 12 tape drives.

New air-conditioned quarters for the 1400 installation are nearing completion and equipment is expected to be delivered by next spring.

The programing department has been expanded for the tremendous effort involved in re-writing the 650 programs, and creating the new ones necessitated by additional applications. Ed Valliere, Jr. hopes to be able to develop another Codematic for the 1400 series. ■

Codematic 650 Block Diagram

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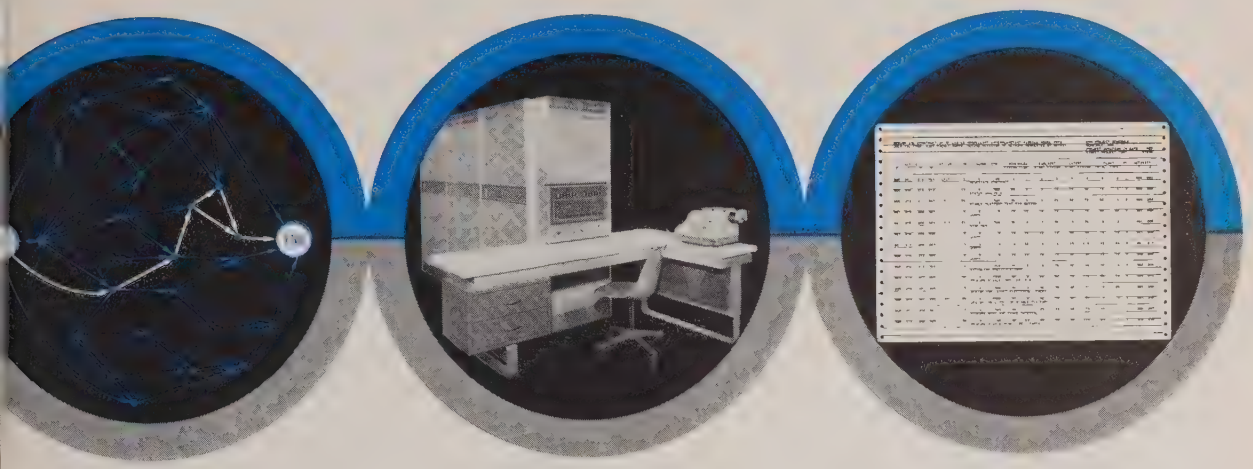

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Eight Hands For the Typist

THREE banks of automatic typing equipment, installed in the underwriting section of the Combined Insurance Co. of America, Chicago, have increased the company's policy-writing output 400 percent.

One typist operating each bank of four units can produce as many policies in a day as four girls were able to produce typing policies, identification cards, company records and welcoming letters individually.

The equipment in each bank includes a master electric typewriter, one Auto-Typist (a programed automatic typewriter) and two Slave-Typists (automatic typewriters which take their instructions from the Auto-Typist). The master typewriter is the one on which the typist actually types up a policy. One of the slaves types the identification card, while the second types up the permanent record card kept in the insurance company files. The Auto-Typist prepares the "welcome letter."

The operator manually inserts the policies into her electric typewriter, but the other three machines are fed automatically.

Programing of each bank is identical. All four types of forms are prepared simultaneously. The actual sequence begins with the insertion, by an operator, of the welcome letter. The Auto-Typist types the date automatically and the carriage returns the letter to the name position. At this point, all four units types the customers name, address, city and state, as the operator types the information directly onto the policy.

Square coops

Auto-Typists are programed with instructions stored on perforated paper rolls similar to piano rolls. Storage space for the rolls is only a fraction of what was needed when the company's letters were printed and stored in bins resembling a book-rack. Now, eight-inch square coops are used instead of the shelves saving considerable space.

Following programed instructions, the automatic typewriter goes on to type the word "Dear" as soon as the address has been completed. The operator then manually types the name on the letter, adding a personal touch to what otherwise is a regular form letter.

The Auto-Typist continues to type the rest of the letter at the rate of 140 words per minute. While that is going on, both slave units are cut off and the operator returns to the electric typewriter to complete the policy.

A light panel consisting of eight stations indicates the steps involved in competing one cycle of this policy-writing operation. Should the operator be interrupted in the middle of the cycle, she could return to it immediately by checking the light panel to see where she had left off.

A bank of machines

Particularly in the letter-writing stage, accuracy is letter-and grammar-perfect with this system. Editing and checking now involves the reading of only one copy; the rest are identical.

The system is supervised by Charles P. Haas who, in commenting on the human side of the installation, says: "The installation is proving to be better for the morale of the girls in the department. They prefer to work with this system rather than the old and out-moded method of typing each form separately. A girl can be trained to operate the new system in less than a week. The only requirement is that she be able to type on electric typewriters. The rest of the operation is a matter of following instructions on the light panel."

Haas also is impressed by the fact that the initial investment for the equipment is low.

"We feel that these units pay for themselves in less than eight months," he says. "Additionally, we're experiencing a savings in space and we're getting a higher degree of accuracy. We are so

Auto-Typist operator is surrounded by a bank of four automatic writers simultaneously preparing documents for a new policy.

satisfied with our installation that we are studying using the policy-writer for other operations.

Combined Insurance's use of Auto-Typists does not end with policy-writing. Additional units are employed in turning out form letters which are sent to doctors, policy-holders and the company salesmen and letters for use in promotional work and community service. Equipment in the general correspondence department amounts to two banks of three units apiece.

"We went into this method of letter-writing to give our correspondence the personal touch," says Haas. "The results have been very gratifying. Our response has gone up 25 percent since we've been using the automatic typing system."

The letter-writing operation consists of typing the name, address and date on each machine, setting the unit on automatic and moving on to the next machine to repeat the operation. The automatic typewriters may be stopped at any point to insert a personalized remark, such as adding the person's name or including a small statement intended to make the letter a bit more informal. The machine is then turned on again and the form letter continues to completion.

Aside from the important personalized injection into the form letters, an additional benefit cited by Haas is that the waste of form letters now has been practically eliminated.

One girl and a bank of machines turns out 130 policies per day in the policy-writing section. Three banks in operation means close to 400 pol-

Two views of the Auto-Typist being used in conjunction with an IBM keypunch machine in the claims department of Combined Insurance Co. Amount of claim is punched into a card as the voucher, involving one of 25 types of claims selected by the operator, is automatically written. Amount is also inserted in letter.

icies written daily. The form letter section produces one letter every three-and-one-half minutes.

Combined Insurance is the nation's second largest exclusive health and accident insurance company. Ten years ago, the company installed a single Auto-Typist unit in the claims department. Through rapid expansion, the necessity for expanding procedures and eliminating bottlenecks became more and more apparent. The solution was found in the versatile automatic typewriter unit.

After studying the unit in the claims department, the equipment also was adapted to policy-writing and form letter preparation in the underwriting department.

The settlement of a claim is a push-button operation, performed by the typist. She types the information needed on the claim check voucher, and when she comes to the place where the explanation is needed, she pushes one of 25 buttons, each of which represents a different explanation. In a separate notation on the form, the claims adjustor has indicated which explanation is to be used.

"This equipment has helped to speed up our operation 30 to 40 percent," says A. F. Kruse, vice president in charge of claims. "It has eliminated an entire operation, one in which we used to type out a separate letter for the sole purpose of explaining the settlement of the claim."

Combined Insurance's growth over the past decade necessitated a move to a six-story building two years ago, and the building is soon to be doubled. New premiums written in 1959 totaled slightly more than $6 million; for 1960, close to $32 million.

The company employs 550 people; has offices in Toronto, Hawaii, Australia and Puerto Rico, besides all the major cities in the continental United States; and owns three other companies in Boston; Fond du Lac, Wis.; and Dallas. ■

Sealed Hypertape cartridge, c
pared with standard tape sys
(left), holds two tape reels,
containing 1800-ft. of tape and
other a take-up reel. Cartridg
inserted in IBM 7340 drive (ab
just 20 seconds before processi

Cartridge Tape System Is Fast, Compact

Product Preview

EMPLOYING a new cartridge-loading technique, IBM Hypertape eliminates the need for threading and, when used in the IBM 7090 computer system, it has the ability to "read" and "write" information at twice the speed of the conventional magnetic tape system. Hypertape currently can be used as an auxiliary storage system, increasing the computer's capability to utilize internal computing power.

Units making up this new system are the IBM 7340 Hypertape drive and the 7640 Hypertape control, which can be linked to IBM's 7074, 7080 or 7090 computers.

Equipped with Hypertape units, the IBM 7074 and 7080 computers can read and write numbers at speeds up to 340,000 a second, or letters at the rate of 170,000 a second, or a typical combination of numbers and letters up to 250,000 a second. The IBM 7090 can perform all three functions at the 170,000 character-per-second rate. At its top speed, Hypertape could enter all 137 million U. S. Social Security numbers into a computer in an hour.

As many as 20 of the 7340 Hypertape drives may be attached to any of the three computer systems through one 7640 control unit.

Among the features of the new magnetic tape system are cartridge loading, which eliminates the need to handle the magnetic tape itself; a new method of data recording and error detection and correction; and an advanced mechanism that moves the tape without touching its recording surface—resulting in less tape wear and greater preservation of data.

In loading, the operator inserts the cartridge into a slot at the front of the unit and presses a button. The machine then automatically opens the cartridge, engages the tape and begins processing. Unloading can take place at any point during processing, since the cartridge can be sealed and removed without rewinding.

A method of detecting and correcting errors in the Hypertape system is provided by IBM Phase Encoding, a signal pattern recorded continuously on tape. Two of 10 channels which run the length of the tape are reserved for checking.

A single roller drive exerts as little as one pound of vacuum tension pull on the tape. The 1-in. wide tape can hold up to 2 million characters per reel. Circle No. 115

New Royaltyper™ turns out personalized form letters all by itself

No matter how large your mailing is, the Royaltyper types every letter in a completely personalized way: in address, salutation, typing quality, even to personal references in the body of the letter.

Royaltyper is a typewriter . . . but a very special one. It's automated . . . does its work all by itself. All a typist has to do is type the first letter on its regular standard typewriter keyboard. This automatically punches the tape (and frees the operator to do other office work). Then the machine takes over . . . at over 100 words per minute . . . all day long. Number of copies: Unlimited. Speed: 3 to 4 times faster than the operator.

No need to pay the high cost of manual typing. Royaltyper does the job for you . . . faster, better, more economically. Get all the facts (and the advantages) of Royaltyper. Call your nearest Royal McBee office, or send us the coupon below. Royal McBee Corporation.

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Please send me full information on the new Royaltyper

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COMPANY _____

ADDRESS _____

Inquiry message is composed for transmission via Unicall computer input device.

Computer Now Has "Answering Voice"

Product Preview

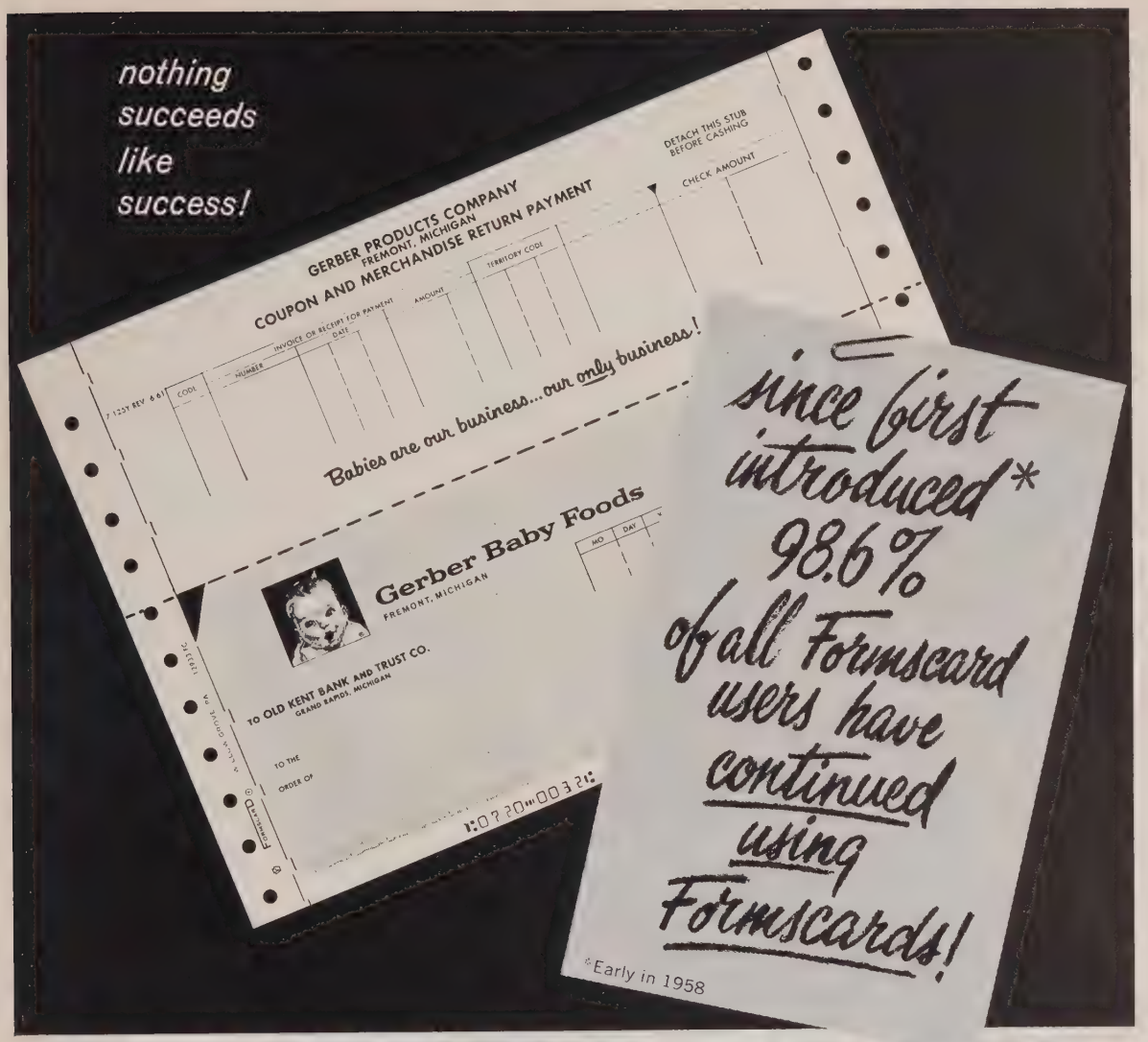
FOR the first time, it is possible to ask questions of a computer from remote locations and receive stored, computer-generated voice replies in return.

Univac real-time computer systems equipped with Unicall, a development of the Remington Rand Div. of Sperry Rand Corp., are expected to simplify and accelerate the up-dating and reporting of changes in inventory, production, distribution and sales is such businesses as airlines, hotels, auto rental agencies, stock brokerage houses, credit reference organizations and department stores.

Unicall devices may be installed in locations hundreds of miles apart and simultaneously secure up-to-the-second verbal replies from the computer. Answers are stored on a magnetic drum at the computer site. After a Unicall message has been processed, the computer selects the appropriate reply from the drum and sends it back over the telephone lines to the Unicall set location. The entire process takes less than five seconds.

Fifty sliding levers on the face of the Unicall set can be positioned to correspond to individual letters or numerals in a specific message or query. This lever-setting operation is simplified by a format guide mounted at the top of the panel. A message display window enables the operator to corroborate his selection of numerals and letters before the message is transmitted.

The message is sent by dialing the computer on a telephone adjacent to the Unicall device. When the connection has been made, the computer sends an acknowledgement signal. Receipt of this signal trips a scanning mechanism and the message itself is transmitted at the rate of 20 characters per second. After receipt of the pre-recorded answer, another signal disconnects Unicall. Circle No. 116



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still the only continuous tab card with NO medial waste strips

Not only does our list of FORMSCARD customers read like a "Who's Who" of Business and Industry... it is also significant that they re-order again and again. Here are some of the unique FORMSCARD features they find invaluable:

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Manufacturers of line-hole continuous business forms.
Samples on request—sales representatives in principal cities.

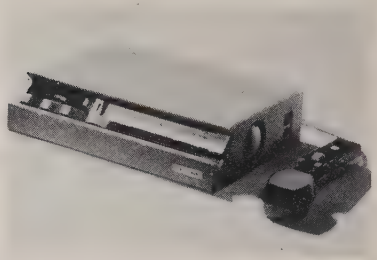
For More Information Circle Reader Service Card No. 168

Business Automation Showcase

Automatic Filing

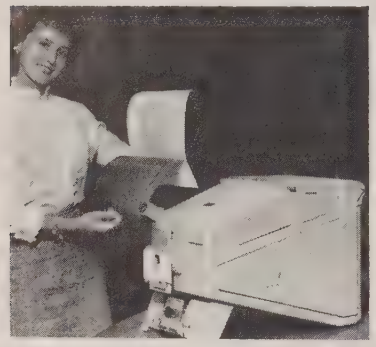
Lektrafile by Remington Rand Systems Div., Sperry Rand Corp., offers push-button filing. A button panel controls all Lektrafile operations. Records carriers move by the shortest route, up or down, to bring files to the reference level within seven and one-half seconds. An electronic eye microswitch provides operator safety by having two beams of light traverse the length of the access area, automatically stopping operation if something crosses them. The system is a fast-cycling, low friction, motor-driven assembly with smooth movement control. The posting board is movable up or down. Circle No. 135

Dictating System



A dictating machine, manufactured by Memofax, Inc., incorporates a device for noting not only start and finish of each unit of dictation, but also locates instantly any additions, changes or corrections which the author wishes to make. The electronic "Magic Memory" feature increases transcribing speed and insures accuracy. Controls for this feature, along with all others, are located in the microphone, including start and stop of the magnetic recording belt, playback, review, location of each letter, changes and a switch for picking up the voice when the microphone is placed on the desk. Memofax is fully transistorized. The magnetic belt quickly slips on and off and it may be used repeatedly. The machine is fully portable and may be run by battery or electricity. Circle No. 132

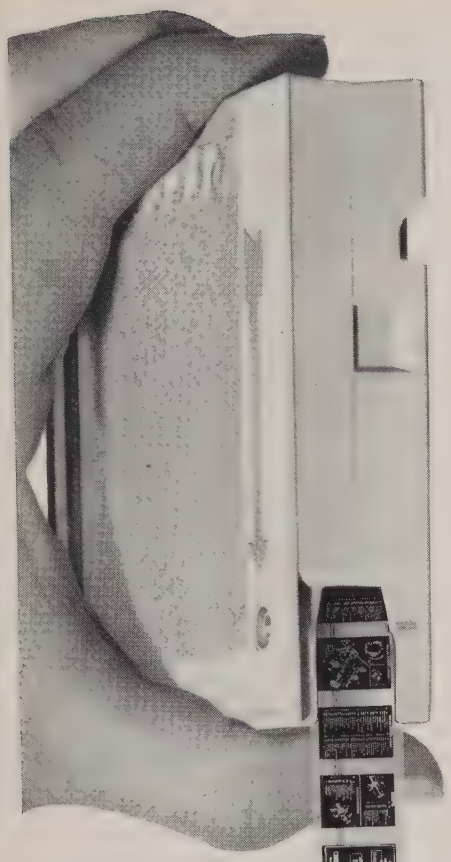
Micro-copy Photocopier



Microcard Reader Corp. has developed a photocopier that makes up to 8½ x 11-in. copies directly from opaque micro-reproductions. The copier enlarges and processes the copies automatically, employing the silver diffusion transfer system. Black and white copies are made, reportedly, in 30 seconds at a cost of less than 11 cents per copy. Model 1 may be used with the company's Microcards—3 x 5-in. cards. Circle No. 141

'Datacase' Line Features Key Punch Desks

Key punch desks are featured in a new line of data processing accessories developed by Steelcase, Inc. Datacase desks give each data processing keypunch operator four drawers for supplies and personal belongings, as well as an extra 570-sq. in. of work space. The top drawer has a removable pencil tray and a sliding reference shelf with a hinged transparent cover. This feature allows the operator to refer to display coding information. The single pedestal desk fits next to the machine reading board and requires only 19 x 30-in. of floor space. Also available in the Datacase line are Steelcase posture chairs, adjustable for the operator's personal comfort. Circle No. 136



Any microfilm record out of millions displayed in less than 20 seconds!

New from RECORDAK . . . an ingenious concept in data retrieval that lets you refer to microfilmed records with incredible ease and speed. No more fumbling with carton flaps, no more threading of film in reader.

Just slip film magazine containing thousands of microfilmed and indexed office records, catalog pages, or decoded computer data into RECORDAK LODESTAR Reader. It flashes on, threads film automatically. Even though film is advanced at speeds up to 600 ft. per minute, the index lines on the 16mm RECORDAK microfilm are easy to follow . . . lead right to the pictures you want.

On-the-job studies show that it actually takes less than 20 seconds for an operator to select a magazine . . . insert it into the RECORDAK LODESTAR Reader . . . and locate any record out of millions which can be kept on microfilm within arm's reach.

Mail coupon today for free folder giving details on interesting applications in business.

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(Subsidiary of Eastman Kodak Company)

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Send free folder describing RECORDAK LODESTAR Reader.

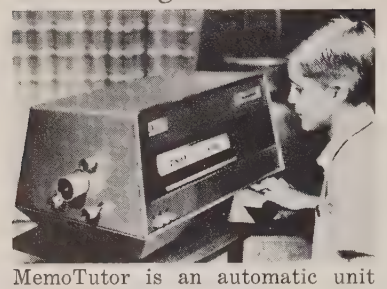
Name_____ Position_____

Company_____

Street_____ City_____ State_____

For More Information Circle Reader Service Card No. 169

Memorizing Machine

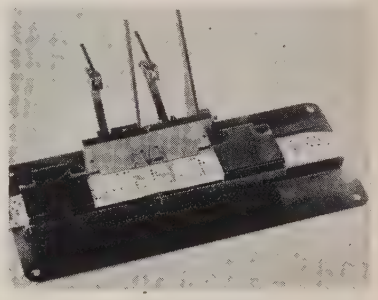


MemoTutor is an automatic unit which aids memorization of lists and facts. Introduced by Robodyne Div. of U. S. Industries, Inc., it is used in training programs and class rooms. Names, codes, formulas, addresses, prices, vocabularies, tables, signs and symbols are memorized easily and rapidly by means of a program that the machine automatically adjusts to the special learning characteristics of the individual. MemoTutor has a storage capacity of up to 960 information elements. The unit has keyboard input and visual output through dual adjustable windows and special control system. Standard programs are available and other material may be prepared and inserted rapidly by the individual user. Circle No. 124

Elevated Floor

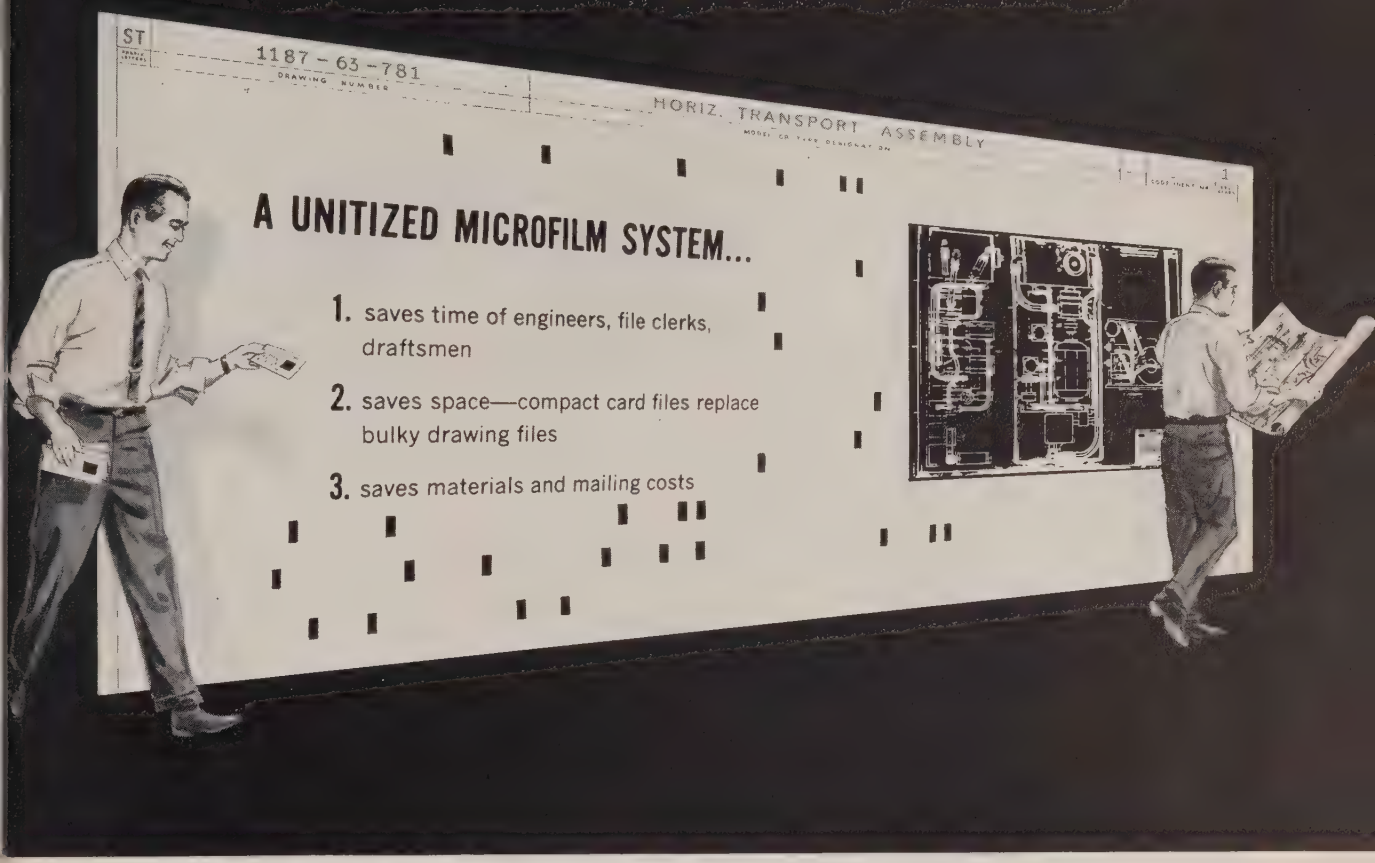
Elevated flooring particularly designed for use in electronic computer installations or wherever extensive cabling and wiring systems require under-the-floor space and immediate accessibility are manufactured by Strato-Floor, Inc. Modular 24 x 24-in. panels are made of plastic, molded around cross-laminated plywood. Said to be highly indentation-proof and wear-resistant, the Strato-Floor has an engineered grid support system substructure offering strength and rigidity without excessive bulk and weight. Steel stringers are bolted to a new kind of adjustable jack. The floor is designed to support a live load of 250-lbs. per square foot and a point lead of 1,000-lbs. The triangular Strato-Tri-Jack uses two points of the triangle to give support to stringer. Circle No. 123

Punched Tape Splicer



A punched tape splicer and splicing tape have been added to the Tape-File line of data processing accessories by Dresser Products, Inc. The splicer has built-in squaring shears for butt splices. It locks firmly to avoid adhesion build-up. The base of the instrument is 4 x 9-in. and the entire unit weighs 4-lbs. The splicing tape is pregummed and fully punched. It is available in $1\frac{1}{16}$-in., $\frac{7}{8}$-in. and 1-in. widths; 10, 25 and 100-ft. lengths. Splices may be made at the ends of message codes, to form loops, or to splice a torn tape within a message, without character losses. It works with oiled or non-oiled tape, five to eight channel. Circle No. 117

Here's a better, more practical way to reproduce engineering drawings



Turn out high-quality prints on ordinary paper by xerography!

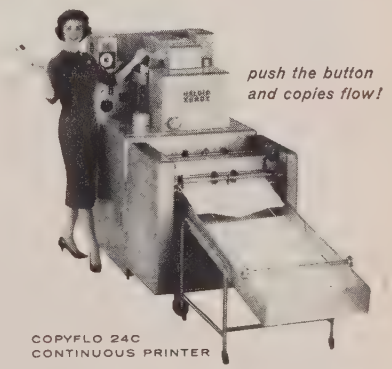
The benefits of a unitized microfilm system begin at the drafting board and spread throughout a company to save time, materials, and space.

1. Important savings result from more productive use of engineers' time . . . no costly waiting for prints. **2. Sizeable reductions** in materials and mailing costs provide further savings. **3. All drafting can be done in pencil** on plain white paper . . . no inking on expensive vellum or linen

A unitized microfilm system has three basic steps: microfilming original drawings or changes; mounting the individual microfilm frames into die-cut apertures of data-processing cards; and, from the cards, automatically enlarging the microfilmed drawings into workable size by a xerographic printer.

Dry, positive, reduced-size prints *on ordinary paper*—easy to read and easy to handle—emerge in seconds, ready for immediate use. There is no refiling. The quality of xerographic prints is superb, yet they are so inexpensive, engineers may discard them after use.

Unitized microfilm systems offer many other striking economies. Our booklet on benefits is yours for the asking. Write Xerox Corporation (formerly Haloid Xerox Inc.) 61-185X Haloid Street, Rochester 3, N. Y. Branch offices in principal U.S. and Canadian cities. *Overseas:* Rank-Xerox Ltd., London.



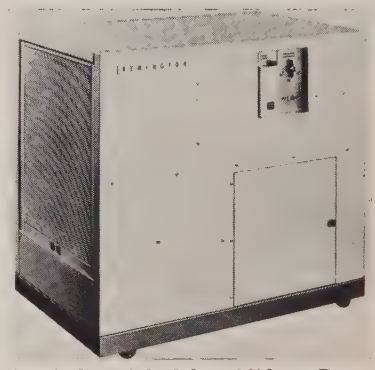
XEROX
CORPORATION

For More Information Circle Reader Service Card No. 170

Tape Reel Cabinets

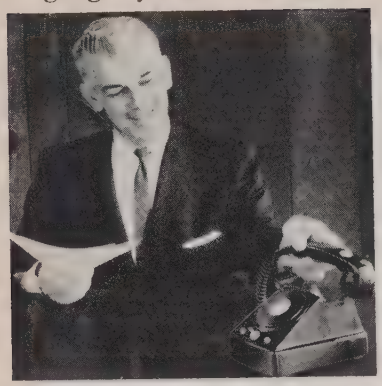
The Model 7116 file insert magnetic tape cabinet has a storage capacity of 95 reels of tape. It is one of the additions to the Datacase line of data processing accessories by Steelcase, Inc. Tapes are stored in the units free from dust. Another cabinet, 7115, has three magnetic tape inserts with a storage capacity of 57 reels. Both cabinets are furnished with doors and locks. Library-type magnetic tape cabinets, both with and without doors, also will be available. Circle No. 137

Dehumidifier



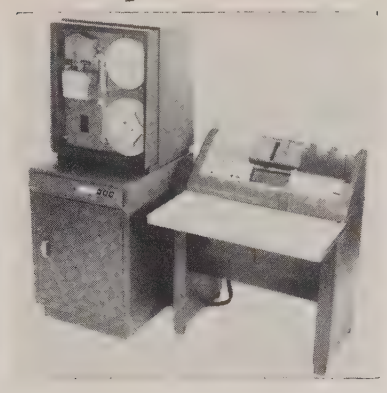
An industrial dehumidifier, Remington's D20 removes moisture at the rate of up to 36 gallons daily. With this equipment, a basement that is normally damp, for example, may be used successfully for punched card storage. Recommended for use in ambient temperatures from 50 to 110 degrees and relative humidities down to 40 percent, the unit passes air through a replaceable furnace filter. An adjustable temperature compensator assures wide range. Circle No. 126

Paging System



Dukane Corp. now has a paging system which combines the versatility of intercommunication with the convenience of the telephone. The 600 Series paging telephone system frees outside switchboards and telephones. Direct person-to-person or conference calls can be made. Employes can be located by name when they are away from desks; announcements can be made; and music or program distribution is an optional feature. Two or three channel systems are available and three phone styles are offered in desk sets or wall mountings. Circle No. 133

Card-Tape Converter



A high speed punched card-to-paper tape converter system, Model K-1277, matches a serial, 45-card-per-minute, photo-electric card reader to a high speed paper tape punch. The combination is fast and inexpensive. Systematics, a division of General Instrument Corp., says the Model K1277 system consists of two units: the K1274 Card Reader and the K1277 Punch Console, connected by quickly-detachable cabling. The system is ready to operate as soon as the programmer wires the plugboard. Circle No. 138

Casting Justowriter

The Line Casting Control Justowriter (LCC-S) has been announced by Friden, Inc. as a faster, more efficient typesetting technique. The equipment can prepare, correct, and duplicate code-punched, six-channel tape for controlling the operation of line casting machines. Codes in the tape will direct an automatic line caster to set and justify each tape line. The Justowriter LCC-S consists of a heavy-duty punch for recording characters and functions and a tape reader for automatically typing and punching from previously punched tape. Circle No. 140

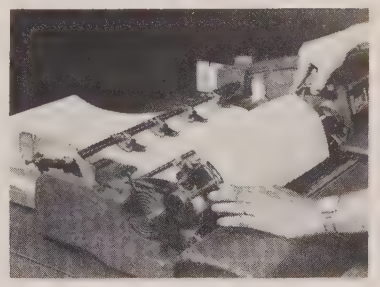
Signature Machine

A hand-operated controlled signature machine lends itself to a variety of signing, certification and validation applications. Designed to aid operations which do not justify an electrically operated model, the T-264 is manufactured by The Todd Co., div. of Burroughs Corp. In addition to its low price, the signer offers a plate area up to 8-sq. in. The machine has dual locks which prohibit the use of the machine by unauthorized personnel, plus a non-resetable counter which accurately records the number of signatures produced. The T-264 is designed to be used with a check register, recording starting and ending numbers. The machine has sleek lines and comes in beige and blue. It utilizes multi-colored ribbon impressions and intricately designed backgrounds, making forgery virtually impossible. The machine also has a positive full-stroke handle, eliminating light or uncounted impressions. The T-264 carries a forgery loss warranty. Circle No. 139

Accounting Machines

Burroughs Corp. has restyled and reduced prices as much as 10 percent on the F6000 series numeric accounting machines. The new series replaces some 15 Sensimatic models which were numbered F100 through F700. Top price for F6000 deluxe machines is $6,740, $245 less than the former Sensimatic line. Basic models in the new series are priced from $2,580. Color combinations have been changed and key tops and cases redesigned. The F-6000 accounting machines are designed for general business applications such as inventory control, payroll and billing. Circle No. 127

Type Cleaner

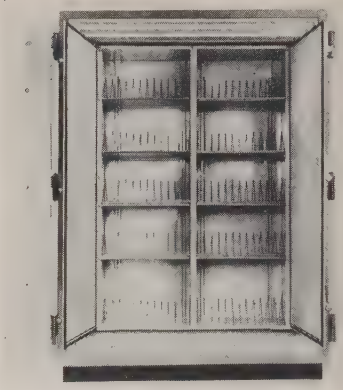


Printer type faces can be cleaned in less than 10 minutes with Minnesota Mining and Mfg. Co. "Scotch" brand 577 type cleaner, designed for chain, bar or wheel printers. Remove or disengage machine ribbon; insert test deck or heavy concentration deck with corresponding panel; pin-feed cleaner into machine, using platen tension to minimum density impression to hold cleaner in place; start machine; and print program enough times to insure each type character is struck at least six times. Stop machine, then tear off used material and discard. Circle No. 122

Microfilm Jackets

Designed to accelerate referral to microfilmed documents or drawings, a microfilm jacket by Photostat Corp. permits the convenient grouping of related images, the use of an easily inserted index tab and the quick retrieval of the entire group of records when required. Illustrative applications are the grouping of patient's hospital records, an employe's personnel records or a borrower's payment records. A file of film in the Photostat jackets contains data which would require 84 three-drawer filing cabinets if stored as originals. Jackets in a variety of sizes are available for either 16mm or 35mm film. Circle No. 129

Tape and Film Safe

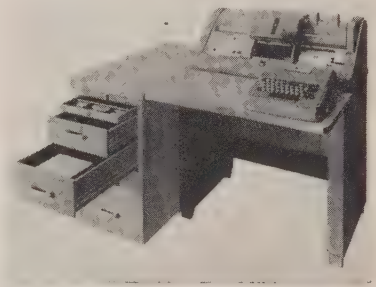


A specially-designed safe for magnetic tapes and microfilm with a "floating" inner repository which protects against fire, moisture and steam has been developed by A. M. Kuechmann, Inc. Protection at point-of-use is the feature of the safe, eliminating the need to transport magnetic tape and microfilm to special storage vaults in other locations. The inner repository is actually suspended within an insulating air space on all sides, top and bottom. It is pressure locked and hermetically-sealed. Mylar magnetic computer tapes and acetate microfilm have been heat-tested by Underwriters Laboratories with no loss of data or projection quality. A combination lock is on the outside door and pressure locks on the inside repository doors. Shelves are removable. Circle No. 120

Card Imprinter

A fully automatic electronic card imprinter by Dashew Business Machines, Inc., delivers impressions of optical or magnetic scanning quality. The machine also insures foolproof positioning of credit or identification card and billing form without pulling, tugging or tearing. Circle No. 119

Key Punch Desk



A key punch desk which provides extra work top surface and drawer space has been added to the Shaw-Walker Co. line of data processing accessories. All at the key-punch operator's fingertips, a wide selection of draw combinations are available. Circle No. 134.

RCA 301 computer now steps up to big system workpower!

Core memory doubled to 40,000 characters! Magnetic tape capability increased to twelve or more 66,000 character/second tape units! System rentals remain low, and you can still begin on a small scale!

Already widely accepted by business and government, the RCA 301 has been so stepped up in workpower that the running time for many jobs has been cut in half. Now it can also tackle much larger and more complex jobs, and can be greatly extended in capacity as your work load grows. With the advanced 301 you have a wider choice of system configuration—and therefore, a better match to your job—than with any other system in its price range. And when you buy 301, you are buying top productivity per rental dollar for your overall needs.

Be sure you evaluate this advanced RCA 301 for *your* data processing needs. Or if you already have an RCA 301 system, add the new memory and high performance tape units as you require them. No reprogramming is necessary.

These new 301 advances are the latest in RCA's continuing program of bringing you higher levels of EDP efficiency through the application of the world's newest electronic techniques.

RCA 301 rental prices begin under $3000 per month, and delivery can be made in less than a year. Contact your local RCA EDP representative, or write: RCA Electronic Data Processing, Camden 8, New Jersey.

The Most Trusted Name in Electronics

RADIO CORPORATION OF AMERICA

NEW RCA 301 SPECIFICATIONS:

Random Access: Data Record File, 27 million char. capacity
Data Disc File, 176 million char. capacity
Core Memory: 10,000-20,000-40,000 characters
Tape Units: 10,000-33,000-66,000 char./second
Printers: Up to two, 750-1000 lines/minute
Card Readers: Up to two, 600 cards/minute
Card Punch: 100 or 200 cards/minute
Paper Tape: Read, 100 or 1000 char./second
Punch, 100 char./second

For More Information Circle Reader Service Card No. 175

Envelope Opener

Incoming mail may be opened and items such as process checks and stubs, coupons and bills may be exposed with the Envelopener. Manufactured by Evans and Assoc., the equipment can be adjusted to open less than 1,000 or more than 5,000 envelopes per hour, depending on type of mail. Mail is placed in the feeder and the machine automatically feeds envelopes and opens each flatly on a moving conveyor, where contents are completely visible for distribution. Moving output conveyor paces rate of work; speed is set by selector dial. An electric counter determines how many envelopes have been processed. Envelopener handles all common sizes of envelopes from 3⅜ x 6-in. to 4⅛ x 9½-in. Size adjustments are not required and sizes may be mixed. Circle No. 130

Paper Tape Reeler

A uni-directional paper tape reeler by Omnitronics, Inc., subsidiary of Borg-Warner Corp., the Omni-Data RS-200 is capable of supplying tape at any speed up to 40-in. per second and of rewinding at speeds from 45 to 60 ips. It may be operated with a tape reader and feed tape from the right reel to the left under reader control; rewinds from left to right under its own control. Breakage is prevented by a motor and brake assembly for each reel shaft, and the position of the dancer arms operates switches which energize either the motor or the brake. Circle No. 125

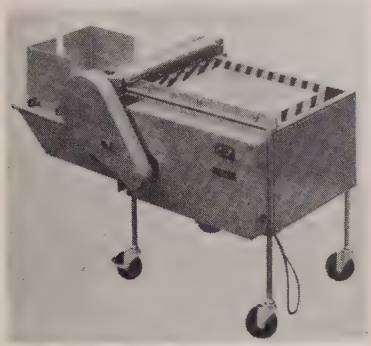
Folding Machine

The Model 222 Baum Printfolder, manufactured by the Baumfolder Div., Bell and Howell, is a three-station feed machine which permits varying sizes of blueprints or other documents to be fed from any of three stations and folded simultaneously. It may be used for the preparation of pieces for mailing or storage. Circle No. 121

Electrostatic Copier

A desk top, electrostatic photocopy machine which prints dry, clear copies has been announced by Smith-Corona Marchant, Inc. Model 33 makes sharp, permanent copies from any original, regardless of color, taking five or six seconds per copy. In routine operation, it should cost less than four cents a copy to operate. It uses sensitized paper which is electrically charged, exposed and developed. Copy paper is automatically fed from a storage rack inside the machine. Insertion of original document sets the electrostatic process in action. The "33" measures 15 x 15 x 24 in. It may be purchased for about $895 or leased. Circle No. 128

Mobile Perforator



The Rollem Mobile Perforator, Creaser and Slitter has been added to the American Printing Equipment and Supply Co. perforator line. The British-made machine is a mobile unit, mounted on heavy casters. It has angle rollers, which will accept sheets as they are ejected from the press either in-line or at right angles. Perforating, creasing and slitting are done simultaneously or singly on paper, covers, cardboard, corrugated papers and plastics. Circle No. 131

Microfilm Recorder

Multiview engineering drawings, schematics, curves and tabular information may be recorded on photorecording paper from magnetic tape with General Dynamics/Electronics' S-C 4020 microfilm recorder. The unit also is useful in the construction of tabular reports; scheduling network charts, such as PERT, PEP and SCAN; bar charts; budgets; production of various types of engineering drawings; and parts programming. Paper copy and 35mm film can be produced simultaneously or the S-C 4020 can be adjusted for individual preparation of either output medium. Information is displayed on the face of a beam tube within the SC 4020, projected through an optical system to an F-80 camera and recorded on 9½-in. wide photorecording paper without the use of darkroom, except in loading. Circle No. 118

Copies On Request

REAL-TIME BROCHURE—"A Real-Time Updating and Transaction Processing System; Phase One" is a report to the National Assn. of Mutual Savings Banks from Stone Laboratories. Circle No. 11

FIVE IDEAS—A booklet, by Moore Business Forms, "Five Ideas that Protect Profits," is designed to help the smaller business keep essential records. Circle No. 102

MCDONNELL CENTER—A 21-page brochure describes consulting, systems designs, programming and data processing services of McDonnell Automation Center. Circle No. 103

NUMERICAL CONTROL—Educational data about the history and methods of the machine tool-numerical control field is available from Friden, Inc. Circle No. 104

WAREHOUSING SCIENCE—Management of materials flow is given a novel twist in Rapistan's suggestion of a "warehousing" approach to the problem. Circle No. 105

WHEN TO AUTOMATE—Topics included in a 14-page brochure published by Designers for Industry, Inc., are (1) how to analyze machinery investment, (2) how to decide when to automate, (3) what to automate. Circle No. 106

MICROFILM—An eight-page illustrated brochure by Minnesota Mining & Mfg. Co. explains the time and dollar savings resulting from an engineering data microfilm system at Collins Radio Co. Circle No. 107

FILE INTERROGATORS—In 24 illustrated pages, Information Products Corp. describes its new line of random access interrogators. Circle No. 108

OFFICE NOISE—A six-page booklet by Modern Partitions, Inc., shows how office noise can be controlled and what optimum sound levels should be. Circle No. 109

NEWS

Honeywell Opens Aerospace Facility

Honeywell's $5 million aerospace facility in Minneapolis houses the biggest Honeywell 800 system built to date and 16 analog computers. The center is the first to handle scientific and business computations simultaneously.

Consolidating its scientific and business computer operations into one center at their aerospace facility in Minneapolis, officials of the Minneapolis-Honeywell Regulator Co. believe they have the only installation of its kind in industry. An array of 16 analog computers and the most powerful Honeywell 800 electronic data processing system yet built, when centralized, can do as much work as seven large computer installations scattered around the country, by solving business and scientific calculations simultaneously.

A staff of 117 persons will constitute the five major departments of Honeywell that will be using the center; Research, Engineering, Contract Management, Factory and Financial.

Scientific work, for which the center is primarily devoted, will take about two-thirds of the computer time on such projects as feasibility calculations, automatic design of small devices and test equipment, simulation of space systems and airborne computers, computation of missile trajectories and orbits.

EJCC in Washington

The 1961 Eastern Joint Computer Conference, involving the data processing industries in promoting the computer sciences, is meeting December 12-14 at the Sheraton Park Hotel, Washington, D. C.

Theme of the meeting is "Computers—Key to Total Systems Control," and it will be manifested in readings of 29 papers and in several of the conference discussions. Approximately 4,000 industry delegates are expected to attend; about 83 exhibitors will showcase their equipment.

Dause L. Bibby, president of Remington Rand Div., Sperry Rand Corp., will keynote the meeting.

Sperry Rand Buys NDP Corp.

Remington Rand Div., Sperry Rand Corp., has purchased for an undisclosed cash sum the National Data Processing Corp. of Dallas, manufacturer of automated bank equipment.

The sale was made by Ling-Temco-Vought, Inc., holders of 51 percent of NDP's stock, and the founding management, which held the balance. NDP reportedly lost over $900,000 in the fiscal year ending September 1960, primarily due to over-extended investments in research and development. This loss reportedly has been written off.

Dause L. Bibby, president of Remington Rand, feels that "this acquisition rounds out a broad line of peripheral devices within our Univac Division.

Electronic Ballot Plan Dropped by Norden

Special to BUSINESS AUTOMATION

A four year, multi-million dollar project to perfect an electronic vote tabulating system for Los Angeles County has been abandoned by the Norden Division of United Aircraft Corp. The Data Systems Department, created by Norden especially for the project, has spent one and one-half million dollars perfecting the system, which according to United Aircraft officials had proven 99.94 percent accurate in its most recent trials. In addition, the county claims to have spent another $900,000 on the system, which now apparently will never be used.

Norden spokesmen say that the project was dropped because the county was unwilling to grant assurance that it would purchase the company's production model, now 80 percent completed. A prototype of the system, capable of reading up to 30,000 ballots an hour, was installed in October, 1960, and has been undergoing tests ever since. The county would not even base

its tenative acceptance on any kind of performance standards, the spokesman added.

The reason for the country's position, according to Los Angeles County manager L. S. Hollinger, was that a "majority of the Board of Supervisors simply could not agree on what kind of voting machine should be used.

Hollinger added that the prototype had presented some problems in the latest tests, especially in the paper handling end of the process. Ballots which had been folded often stuck to one another, he said, and two ballots sometimes fed through at one time. Another problem was that ballots that entered the system might not be read at all.

Norden felt that its new production model—which incorporated an improved paper handler and computer unit—had the solution to these problems. They estimated that their vote tallying system would have saved the country $50,000 per operational unit during each major election year.

The 10 systems projected to handle the county's huge tallying job —biggest single block of voters in the country—would have represented over one and one-half million dollars in savings per year. As recently as last January, a state commission had officially approved the system for use in California.

Calculation on a "Shoebox"

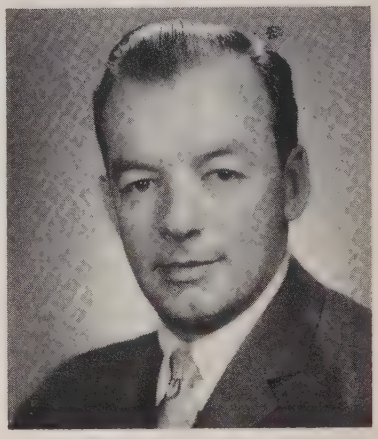
Arithmetic is performed by voice command on an experimental machine called "Shoebox." The device recognizes up to 16 words spoken into a microphone, including 10 digits. When words such as "plus," "minus" and "total" are spoken, it instructs an adding machine to calculate and print out answers to simple arithmetic problems.

Developed by the Advanced Systems Development Div. of International Business Machines, Corp.'s San Jose, Calif., laboratory, the experimental device is being used to study the technical feasibility of machines that recognize and handle spoken information. IBM has no plans to manufacture such machines, they some day may provide access to information systems for people who are too busy to prepare information for computers; such as pilots or cashiers.

The operation of Shoebox begins when a person first speaks into a microphone and his voice sounds are converted into electrical impulses. A measuring circuit classifies these impulses according to the various types of sounds. Circuitry in the solid state device contains only 31 transistors, fewer than two for each word it recognizes.

The measuring circuit registers works in three parts and responds by striking the keys of the adding machine. Although the device will respond to a wide range of voices, it works best when it is adjusted to the vocal characteristics of one speaker.

Mead Made Chairman

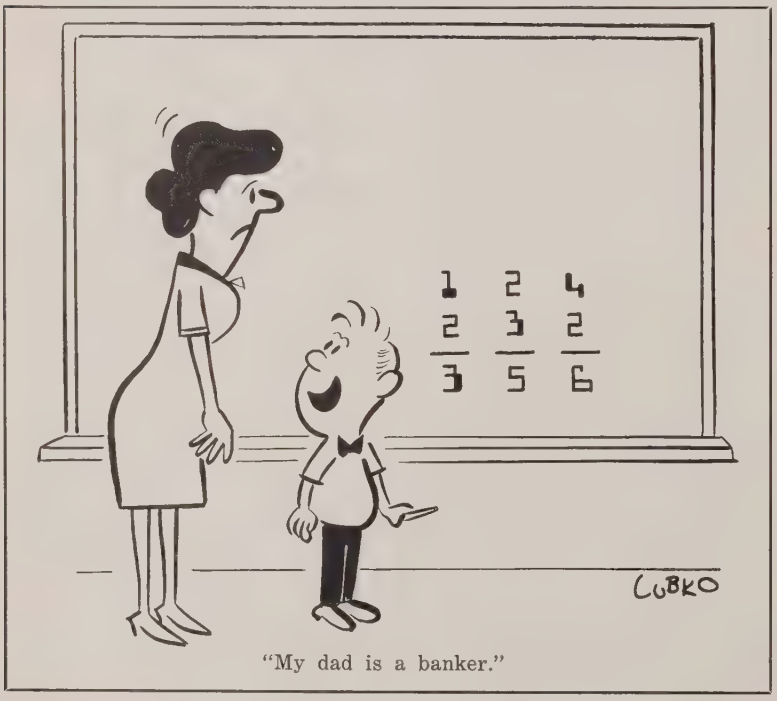


Emerson E. Mead

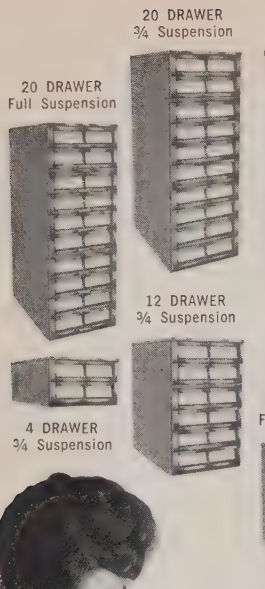
The Business Equipment Manufacturer's Assn. has elected Emerson E. Mead, president of Smith-Corona Marchant, Inc., as chairman of the board of directors at its annual meeting in New York City.

Vice-chairmen also elected by 200 members, representing 50 office equipment, EDP and furniture manufacturing companies, were R. S. Laing, vice president of National Cash Register Co., and J. W. Birkenstock, vice president of IBM.

The association held open house at its new headqarters in the Pfizer Building. Emphasized was the increased activity in standardization of office equipment and the necessity, in conjunction with this, of becoming an international organization.



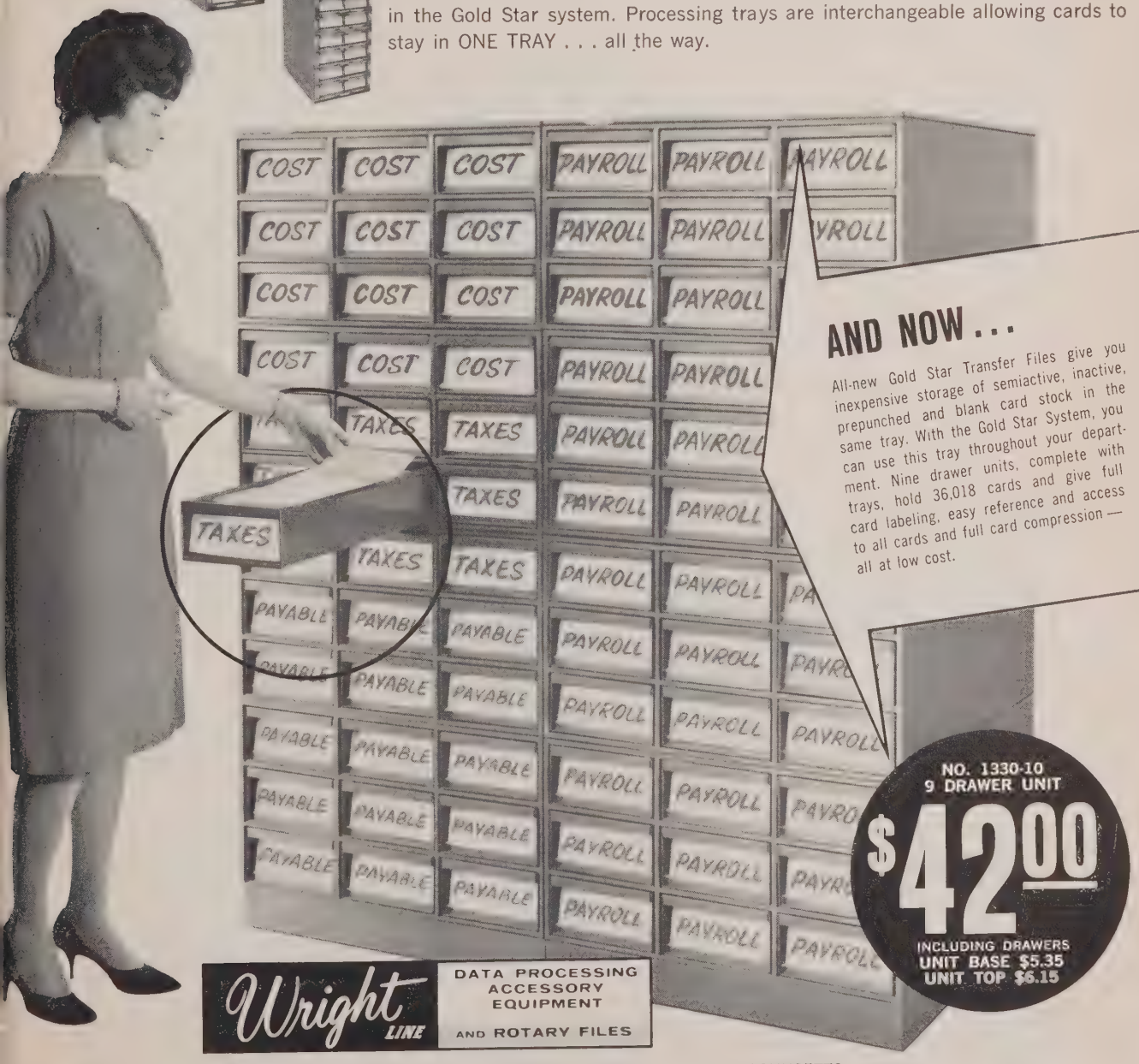
"My dad is a banker."



GOLD STAR FILES

ONE TRAY... ALL THE WAY!

A NEW SYSTEM **OF CARD HANDLING.** Now, for the first time, a horizontal tray system for use throughout the data processing department for card reference, handling, processing at machines and inactive storage in the all-new Gold Star file system. No transfer of cards by the handful when moved from current to inactive files in the Gold Star system. Processing trays are interchangeable allowing cards to stay in ONE TRAY . . . all the way.



AND NOW...

All-new Gold Star Transfer Files give you inexpensive storage of semiactive, inactive, prepunched and blank card stock in the same tray. With the Gold Star System, you can use this tray throughout your department. Nine drawer units, complete with trays, hold 36,018 cards and give full card labeling, easy reference and access to all cards and full card compression — all at low cost.

NO. 1330-10
9 DRAWER UNIT

$42.00

INCLUDING DRAWERS
UNIT BASE $5.35
UNIT TOP $6.15

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DATA PROCESSING ACCESSORY EQUIPMENT
AND ROTARY FILES

DIVISION OF BARRY WRIGHT CORPORATION, WORCESTER, MASSACHUSETTS

Products Sold Exclusively by Our Sales Organization Throughout the United States and Canada.

FACT Business Compiler Now a Fact

FACT, the much discussed and long delayed automatic business compiler developed by Minneapolis-Honeywell for users of the 800 computer system, now is an operating reality, according to an announcement by Walter W. Finke, president of Honeywell's EDP division.

Tapes containing the "fully automatic compiling technique" have been delivered to Honeywell customers for systems test purposes. These tapes contain the FACT compiler in a form that will permit users to compile and operate many of the FACT programs written to date. Additional tapes are being released this month to supplement the present version.

FACT has been under test for many months on an around-the-clock basis on three 800 systems at Honeywell's Wellesley, Mass., headquarters. It is said to be the first parallel processing operating system provided for any electronic computer. Development cost is reported to be in excess of a million.

RCA Signs Pair of Foreign Agreements

Initial order of 50 RCA data processing systems, with an option for an additional 50 or more, has been signed in a multi-million dollar agreement between Radio Corp. of America and International Computers and Tabulators Ltd. of England. Another agreement allows for the exchange of patent licenses and technical information for the same equipment.

These agreements are similar to an international agreement recently signed between RCA and Compagnie des Machines Bull of France.

The agreements constitute the largest commercial sales of EDP equipment ever made.

Shipments to England will begin in quantity by mid-1962 and be completed by 1964.

IBM Eyes Forms

International Business Machines Corp. recently announced that the Supplies Div. "has been actively pursuing the possibilities of augmenting its present line with some additional specialized data processing continuous forms."

This statement was made in answer to a Wall Street rumor that IBM would enter the business forms field. Last March, the division did add paper checks—in both continuous and unit set form—to its line for use with specialized equipment.

No announcement has yet been made of any product introduction to the market.

NMA Re-elect Prexy

The 65,000-member National Management Assn. recently re-elected L. Fred Magruder, executive of Talon, Inc., to the office of president.

John K. Christoph of Lockheed Aircraft Corp. was elected first vice president and H. E. Hauser of the Tool Steel Gear and Pinion Co. was named secretary-treasurer.

Keynoter for the annual convention was Maj. Gen. John A. Barclay, vice president of Lionel Corp., who emphasized that "the business manager without a measure of technical competence cannot honestly assume total responsibility."

Business Calendar

December 2-5—Four-day International Visual Communications Congress is scheduled for the Biltmore Hotel, Los Angeles. Contact: VCC, 18465 James Couzens Hwy., Detroit 35.

December 11-12—Seminar conference on "Accounting Applications of EDP," sponsored by the National Assn. of Accountants, Hotel Penn-Sheraton, Pittsburgh. Contact: NAA, 505 Park Ave., New York 22.

December 12-14—Eastern Joint Computer Conference, Sheraton-Park Hotel, Washington, D.C., follows the theme: "Computers—Key to Total Systems Control."

December 14-16—Forum on Legal Questions Raised by Computer Use in Business, sponsored by the Joint Committee on Continuing Legal Education of the American Law Inst. and American Bar Assn., at the Statler-Hilton, Los Angeles. Contact: J. E. Mudler, dir., 133 S. 36th St., Philadelphia 4.

December 26-30—A one-week course on Systems Analysis will be conducted at the Philco Computer Center, Willow Grove, Pa. Contact: C. A. Leventhal, Philco Computer Div., 3900 Welsh Rd., Willow Grove, Pa.

January 3-5—A six-hour seminar meeting two hours a day for three days will provide an Introduction to Data Processing, sponsored by Philco Corp., Willow Grove, Pa. Contact C. A. Leventhal, Philco Computer Div., 3900 Welsh Rd., Willow Grove, Pa.

January 9-11—8th national Symposium on Reliability and Quality Control, to be held at Statler Hilton Hotel, Washington, D.C.

January 15-17—Symposium on Optical Character Recognition, the Dept. of the Interior Auditorium, Washington, D. C. Contact: Miss Josephine Leno, Code 430 A, Office of Naval Research, Washington 25, D. C.

January 18-20—Subject conference on "Reports to Management" will be sponsored by the National Assn. of Accountants, Hotel Conrad Hilton, Chicago. Contact: NAA, 505 Park Ave., New York 22.

Book Reviews

Decision Models for Inventory Management

By R. B. Fetter and W. C. Dalleck. Published by Richard D. Irwin, Inc., Homewood, Ill.

Using mathematical models to pre-solve the problems encountered in inventory management is a relatively new and revolutionary concept. It can be said that model making is extremely technical for the layman to understand and that it will work only if properly executed by people who are experts in what they are doing.

The book deals with creating mathematical models which simulate the function of inventory control. The use of simulation is just coming into its own as a scientific business technique (see BUSINESS AUTOMATION, May 1961, p. 14). Mathematical models and simulation may be used in several areas, but a specific problem handled the way inventory control is handled in this book should do much to advance the technique.

This book is part of a series in quantitative analysis for business offered by the publisher and edited by Fetter.

Management Models and Industrial Applications of Linear Programming

By A. Charnès and W. W. Cooper. Published by John Wiley & Sons, Inc., 440 Park Ave. S., New York City 16. $11.75.

Early in the development of linear programming, leading to its ultimate application to business problems, were Professors Charnes and Cooper who, together with the late A. Henderson, authored the classic "An Introduction to Linear Programming" in 1953.

Linear programming has now come of age and the first book explaining the method used in creating models for such applications as transportation, storage, inventory and functional efficiency has been introduced. In its own way an introduction to the application of linear

programming, a healthy knowledge of the 1953 book and of algebra is recommended.

This book is very thorough, technical and of interest only to the specialist. A second volume promises to be even more so.

The Folklore of Management

By Clarence B. Randall. Published in association with Dun & Bradstreet, Inc., Book Div., 99 Church St., New York City 8, by Atlantic-Little, Brown and Co. $4.75.

Management myths thriving in the electronic age of business are probed thoroughly by Clarence B. Randall, former president and Chairman of the Board, Inland Steel Co., and foreign economic advisor to President Eisenhower.

Juggling the sentiments of management, labor, politics and the dictums of ethics, the author succeeds in painting a colorful and credible, if not a little too idealistic, picture of level-headed management in a furiously complex business world.

Particularly damning are Randall's expose on the myths of communication in business, the belief in "magic numbers" and the importance of specialists as the symbols of the scientific age in business.

In spite of electronic marvels, the author states, communications begin at home. That is, it basically is an act between two people that have something to say to each other. Electronics can be an aid. Computer figures, statistics and surveys do not run businesses or market products by themselves. They are also aids to be used wisely —and sparingly. The same goes for specialists, with whom Randall is particularly unkind. Mastering a small segment of a business and nothing else, says Randall, does not make a man an executive.

Basically, Randall presents a few obvious conditions that any businessman copes with daily. It is done, however, in a brilliant and lucid manner. Reflective management undoubtedly will find itself guilty of propagating more than one of the business world's "modern myths."

Card System Control

Continued from Page 19

author's past experience in this field. They are not presented as absolutes, but as a guide. It is suggested that potential users review them carefully and make such adjustments as their own experiences may dictate.

The results obtained from the foregoing calculations for each machine and clerical operation in the job may be entered now on the procedure flow charts, as were input/output dates and job numbers. The time has come, however, when a more appropriate recording medium should be introduced.

The basic job inventory record, which we will call the Job Control Card, should contain all pertinent information about a given job except the detailed operator instructions. Exhibit 5 presents a suggestion for such a Job Control Card. Entries to this card should be made in conformance with criteria and codes developed in the preceding paragraphs. A deck of these cards representing the entire normal production of the machine accounting department should be kept at all times in the manager's office, filed preferably by job number within frequency.

For each job step on the Job Control Cards, Scheduling Master Cards must be punched and interpreted to include job and deadline codes, machine symbols and the total standard hours for the operation. In addition, there must be punched a deck of cards which we will call Available Machine Time Cards, showing for each class of machine (and clerical work station) the available hours for each working day of the month. These cards may be prepared in any convenient format. When they are complete, schedule preparation begin.

Production should be scheduled (Exhibit 6) for each calendar month. The schedule should show the due-in times of materials to be received from others, the due-out times of documents and reports to be issued by the machine accounting department, and the sequence of operations to be performed. The schedule should be prepared on or about the 15th working day of the preceding month and should be updated continuously as more current information becomes available.

The routine for preparing a schedule consists of developing a first approximation, making necessary adjustments and running the final schedule.

To develop a first approximation requires several steps. Due dates on the Scheduling Master Cards are converted to the working days of the month being scheduled. The Available Machine Time Cards are adjusted for anticipated availability on specific working days. The approximation then is listed, showing by machine type, the individual job time requirements and the excess or shortage of available time for each working day.

Shortages are adjusted, whenever possible, by work rearrangements within the framework of due-in, due-out dates for source materials and final products. Where this fails, rearrangements are attempted through negotiation with the departments being serviced.

The Scheduling Master Cards for the rearranged work are repunched, sorted by due-in date and listed in the appropriate scheduling format. Copies of this final schedule are distributed to the machine accounting manager and his supervisors on or before the last working day of the month preceding the one that has been scheduled. ■

Next Month . . .

Forecast—1962 **A special survey conducted among leaders of the business automation industry reveals prospects for the coming year.**

ADVERTISERS' INDEX – DECEMBER, 1961

Acco Products ..... 2nd Cover
Agency–Geer, DuBois & Co., Inc., New York City

Acme Visible Records, Inc. 65
Agency–Cargill-Wilson Advertising, Richmond, Va.

Addressograph-Multigraph Corp. 3
Agency–The Griswold-Eshleman Co., Cleveland

Anelex Corp. 56
Agency–Thorndike & Thomas, Providence, R. I.

Automation Consultants, Inc. 10-11, 34

Bankers Box Co. 8
Agency–Frank C. Jacobi Advertising, Inc., Chicago

C. L. Barkley & Co. 52
Agency–Frank C. Jacobi Advertising, Inc., Chicago

Brady, W. H., Co. 6
Agency–Franklin Advertising, Inc., Milwaukee

Burroughs Corp. 35
Agency–Campbell-Ewald Co., Detroit

Business Automation 12

Business Electronics, Inc. 52
Agency–Graham Kislingbury, San Francisco

Cheshire, Inc. 54
Agency–Robert W. Deitz & Associates, Chicago

Comptometer Corp. 62
Agency–Frank C. Nahser, Inc., Chicago

Electronic Associates, Inc. 64
Agency–Gaynor & Ducas, Inc., New York City

Fairchild Camera & Instrument Co. 7
Agency–Marsteller, Inc., New York City

Forms, Inc. 45
Agency–Elkman Advertising Co., Inc., Philadelphia

Friden, Inc. 61
Agency–Richard N. Meltzer Advertising, Inc., San Francisco

General Electric Co., Computer Dept. 36-37
Agency–The McCarty Co., Los Angeles

International Business Machines Corp. 28-29
Agency–Marsteller, Inc., New York City

F. G. Ludwig, Inc. 55
Agency–Lawrence Selwyn Associates, Hartford, Conn.

Mac Panel Co. ..... 4, Back Cover
Agency–Lavidge, Davis & Newman, Inc., Knoxville, Tenn.

Magnetic Aids, Inc. 8
Agency–Dale Associates, New York City

McDonnell Automation Center 9
Agency–John Patrick Starrs, Inc., New York City

National Cash Register Co. ..... 3rd Cover
Agency–McCann-Erickson, Inc., New York City

Phillips Ribbon and Carbon Co. 6
Agency–Hanford and Greenfield, Rochester, N. Y.

Photostat Corp. 13
Agency–Lambert & Feasley, Inc., New York City

Radio Corporation of America 53
Agency–Al Paul Lefton Co., Inc., Philadelphia

Recordak Corp. 47
Agency–J. Walter Thompson Co., New York City

Royal McBee Corp. 43
Agency–Young & Rubicam Inc., New York City

T. W. & C. B. Sheridan Co. 48
Agency–Robert S. Fenn & Associates, Chicago

Sten-C-Labl, Inc. 50
Agency–Gibson-Erlander, Inc., Minneapolis

Tech Panel Co. 25
Agency–Richard LaFond Advertising, Inc., New York City

Thomas Collators Inc. 60
Agency–Douglas Turner, Inc., Newark, N. J.

Varityper Corp. 41
Agency–Bruce Angus Advertising, Inc., New York City

Watson Mfg. Co., Inc., Rol-Dex Div. 63
Agency–Griffith & Rowland, Jamestown, N. Y.

Wright Line: Div. of Barry Wright Corp. 59
Agency–Cooney & Connor Advertising, Worcester, Mass.

Xerox Corp. 49
Agency–Hutchins Advertising Co., Inc., Rochester, N. Y.

EDITORIAL

Prophecy Fulfillment

A favorite sport of politicians and labor bosses these days is to cast brickbats at the computer, picturing it as an electronic monster whose prime purpose is to devour all of the nation's job opportunities. The sport is not new, merely the target. In earlier days similar blasts were directed against the typewriter and adding machine.

Fifteen years ago, when the first electronic digital computer came into being, its principal inventor, Dr. John W. Mauchly, correctly predicted that in "high-speed computing lie possibilities which effect us all—better transportation, better clothing, better food processing, better communications, better weather forecasting, better housing." The computer has fulfilled these prophecies—and then some.

Today, some 6,000 computers of all types are in operation. About 15 percent of the total are used primarily for scientific and engineering purposes; their uses ranging from control of industrial processes to space flight communication and control.

Some 40 percent are used for military applications. Modern warfare with its rockets, radar and supersonic speeds is largely dependent upon electronic computers. Fire control and ballistics, rocket tracking, computing problems of logistics and supplies, tracking submarines and providing counter measures and early warning systems for guarding the nation against surprise attack are but a few of the vital functions that rely in part upon the phenomenal capacities of the computer.

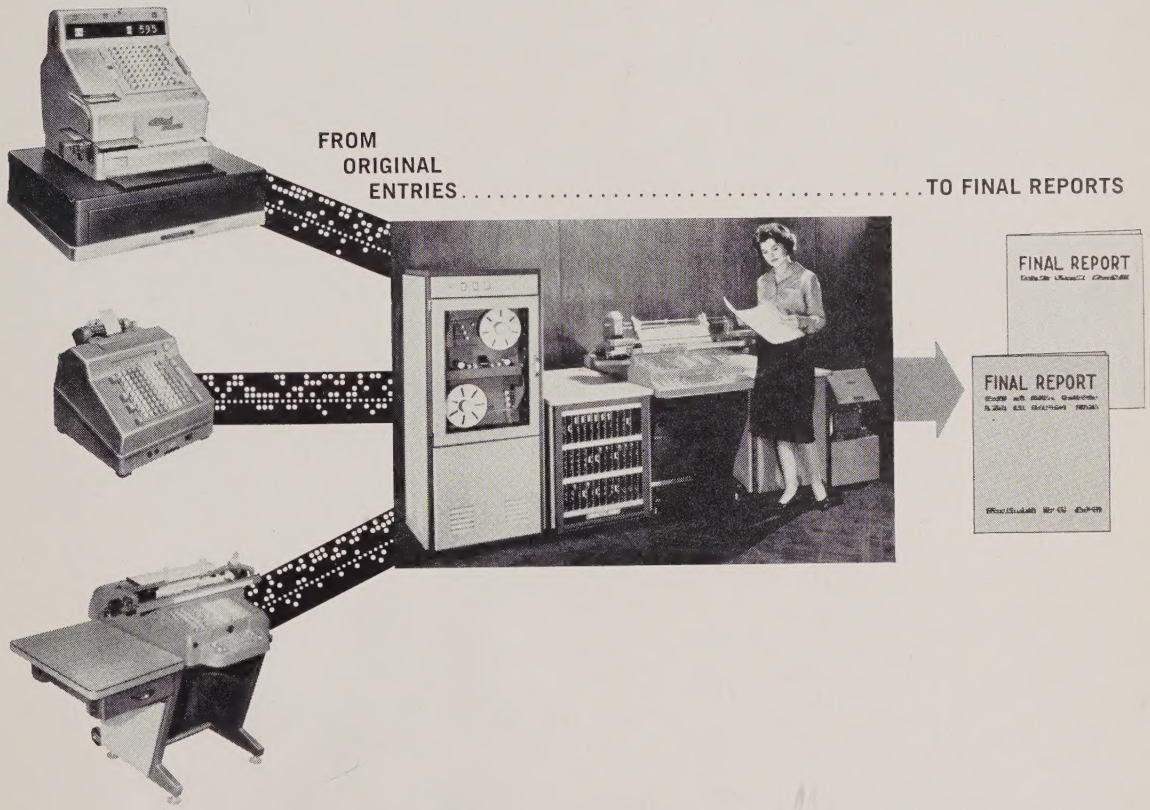
The remaining 45 percent are involved in business data processing systems. Besides bringing increased speed and efficiency to routine paperwork chores, these computers are providing valuable assistance to marketing, production and product research.

Even greater possibilities lie ahead. For example, it has been estimated that half of all the money spent in 1960 for research and development might have been spent differently and more effectively if all the available literature had been searched properly beforehand. With computers, it will soon be possible to recall information automatically from millions of scientific and technical articles—all at electronic speeds.

The computer has made possible an infinite extension of man's ability to grasp, predict and control. It is rightfully called one of the greatest achievements of the century. No one need apologize for its greatness, nor for its effects on our economy. Certainly the computer causes job displacement, as did the wheel, the windmill, electricity and the automobile. Likewise, the computer brings with it assurances of more and better jobs, new industries, and a growing economy that will enrich the entire free world.

Arnold E. Keller

YOUR business will benefit with NCR Data Processing!



Regardless of the type or size of your business, you will benefit from the efficiencies of National Data Processing. From one or more of NCR's original entry products—accounting machines, cash registers, listing, window posting and receipting systems—you can get just the input media of your need and choice. This may be punched paper tape or punched cards.

This input media is processed quickly, accurately and economically by an NCR computer specifically designed to furnish complete record information tailored to your specific needs. NCR offers a full range of Data Processing Systems: small, medium, and large-scale computers, plus a network of processing centers.

For more complete information on how NCR Data Processing can benefit your business, call your local National Branch Office or WRITE TO US TODAY!

NCR GOES ALL THE WAY FROM ORIGINAL ENTRIES TO FINAL REPORTS.

THE NATIONAL CASH REGISTER COMPANY, Dayton 9, Ohio
1039 OFFICES IN 121 COUNTRIES • 77 YEARS OF HELPING BUSINESS SAVE MONEY

NCR® *TRADEMARK—REG. U.S. PAT. OFF.
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ELECTRONIC DATA PROCESSING
ADDING MACHINES • CASH REGISTERS
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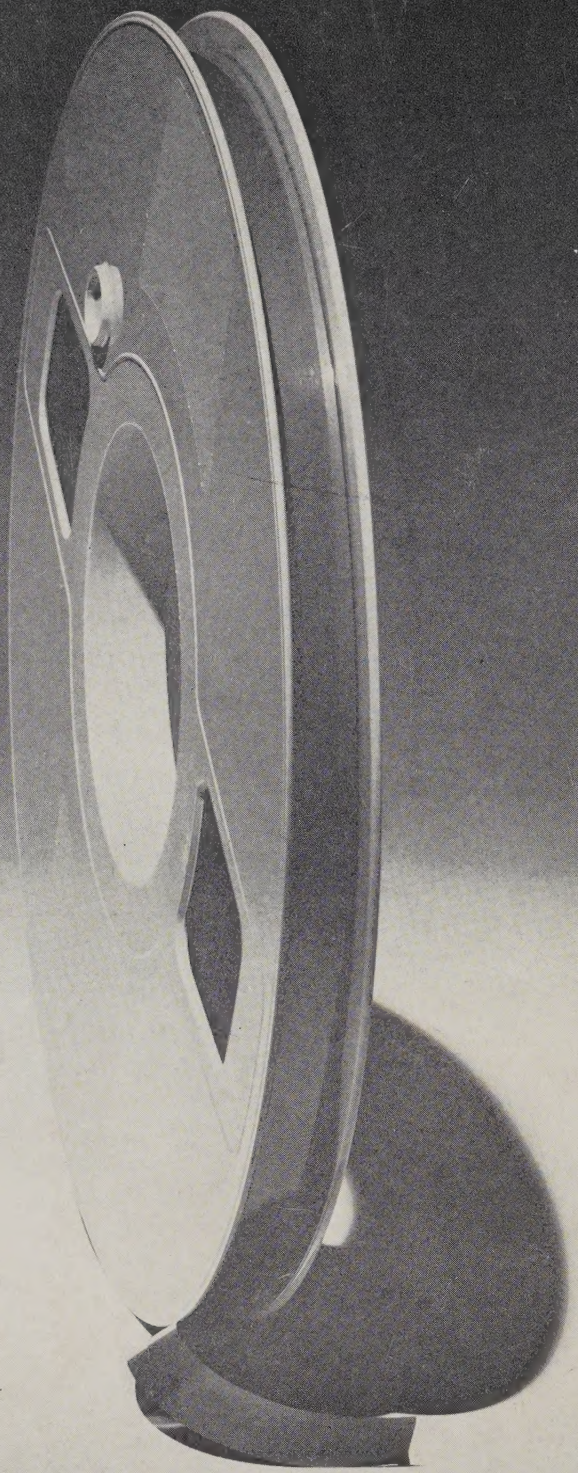
For More Information Circle Reader Service Card No. 187

MAC PANEL *computer tape* . . . ASSURED PERFORMANCE



Division of Adams-Millis Corporation

MAC Panel Computer Tape is produced under rigidly controlled, scientific conditions to give you assured tape performance. *Manufactured for Performance* through the use of an improved oxide formulation that insures the presence and retention of the most critical magnetic properties as well as the prime physical characteristics: permanent coating adhesion . . . hard shell toughness . . . and flexibility under all conditions. *Tested for Performance* using procedures that far exceed the normal criterion for attention to detail. Every element in the new oxide formulation is tested before and after blending . . . every reel of tape produced is subjected to thorough tests which insure the quality of MAC Panel Computer Tape. *Packaged for Performance* in clean, dust-proof containers hermetically sealed inside a plastic envelope. This entire unit is shipped to you in a specially designed, shock absorbing package that features a "handy-handle" for carrying convenience. *Write for Free Booklet:* "MAC Panel Computer Tape . . . Assured Performance."

MAC PANEL COMPANY ■ High Point, North Carolina MAC/ PANEL